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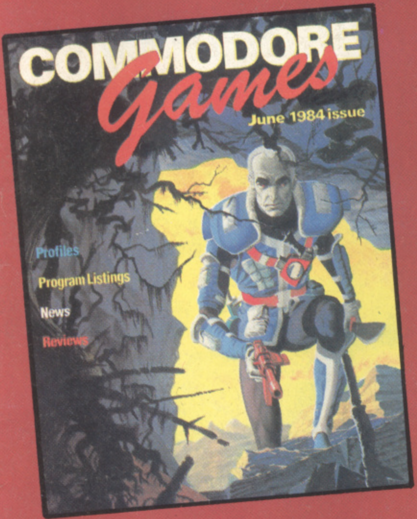
COMMODORE

COMPUTING INTERNATIONAL

The Independent Commodore Magazine

FREE

Games supplement



COMMODORE *Games*

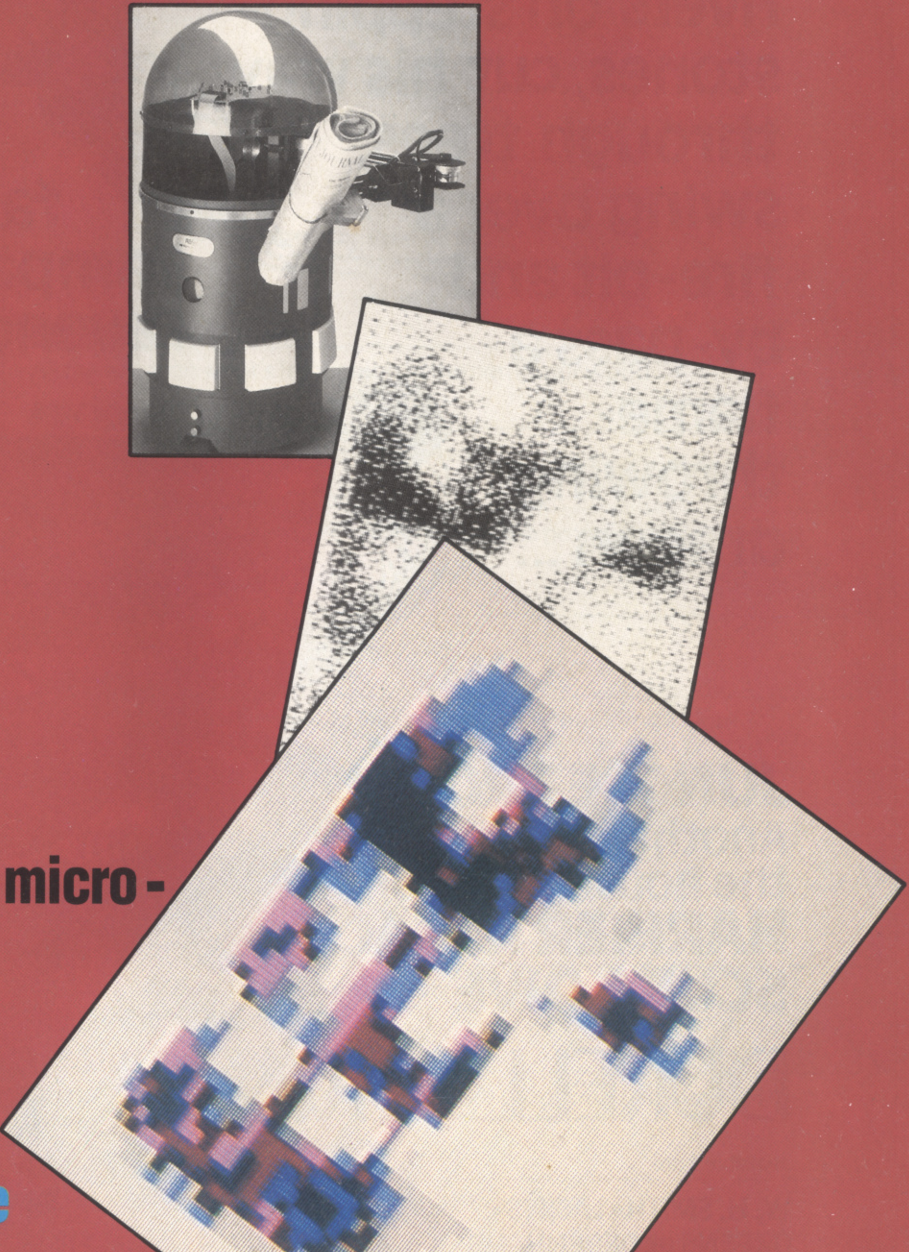
June 1984 issue

Profiles

Program Listings

News

Reviews



PLUS

SIGHT & SOUND on your micro -

64 eyes

More music

Commodore Show guide

***Program Listings*Hints & Tips**

***Machine Code*News*Reviews**

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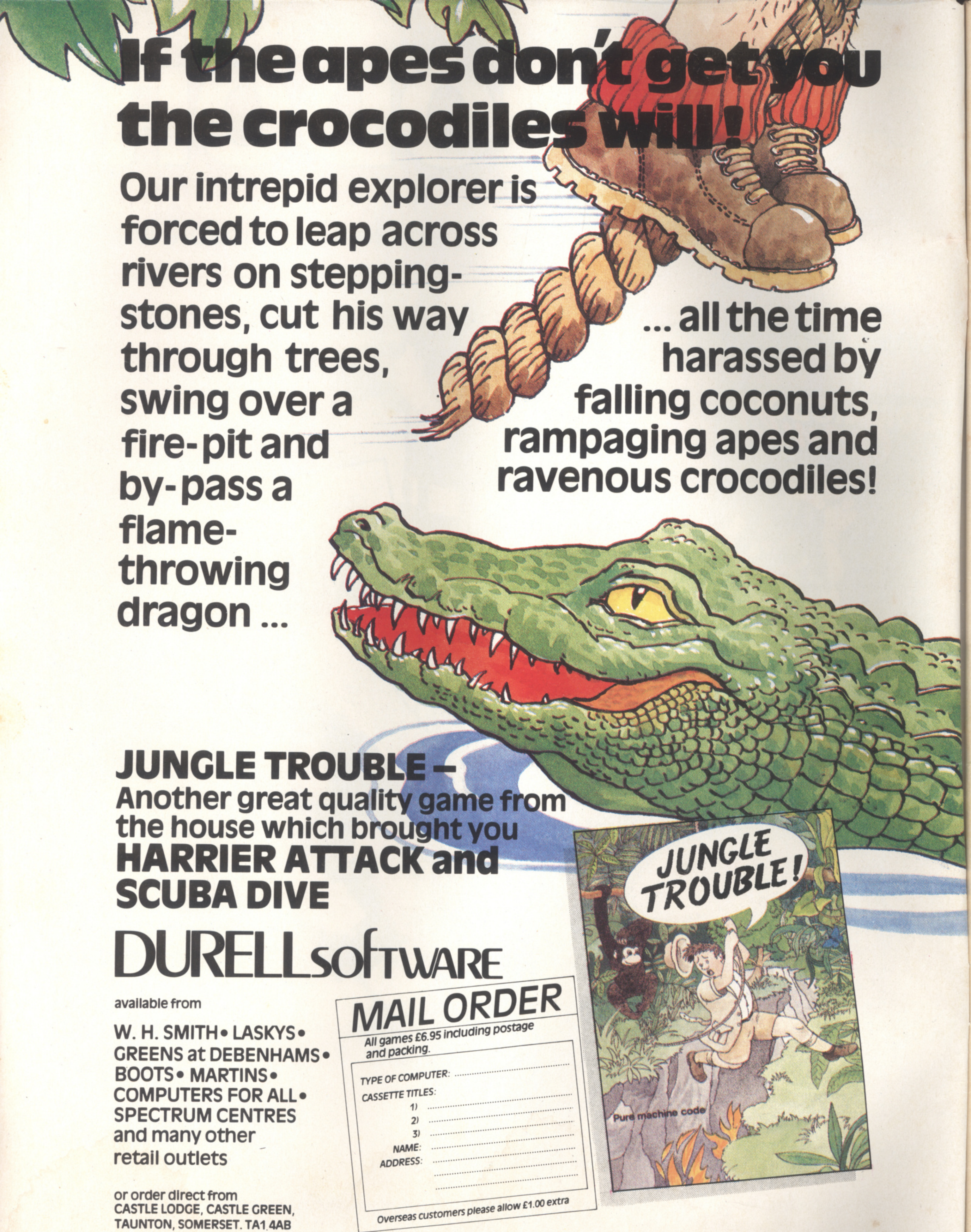
If the apes don't get you the crocodiles will!

Our intrepid explorer is forced to leap across rivers on stepping-stones, cut his way through trees, swing over a fire-pit and by-pass a flame-throwing dragon ...

... all the time harassed by falling coconuts, rampaging apes and ravenous crocodiles!



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....
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COMMODORE
COMPUTING INTERNATIONAL
JUNE 1984

COVER STORY

Vol 3 No 1 UK£1
COMMODORE
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More music
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*Program Listings*Hints & Tips
*Machine Code*News*Reviews

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Consultant Editor ....Peter Arnott-Job
Production Manager ....Richard Povey
Assistant Editor ....Sue Pearce
Staff writer ....Sally Wood
Technical Editor .... Richard Franklin
Programmer ....Carl Graham
Advertisement Manager Peter Chandler
Advertisement Executive...... Paul Fenton

Telephone:	
Editorial	01-636 6531
Advertising	01-636 6408 01-636 6615
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NEWS 5
All the latest on what's happening in the computer world

PRODUCT NEWS 6
The latest products for Commodore users

MUSIC 11
A program to achieve additional sounds to the program published last month

PROJECT 19
Enabling your 64 to 'see'

SHOW 20
Floorplans, a list of exhibitors and attractions at the Commodore Show

LETTERS 23
You moan and groan and we do our best to help

REVIEWS 25
We look at new products including the Koala Pad

HINTS AND TIPS 29
Running a Basic program from Machine Code and plotting user-defined characters for the 64

BASIC PROGRAMMING 33
Completing our Desk Diary program and a program to turn your 64 into a music keyboard

MACHINE CODE 43
Merge and re-number routines for the 64

BUSINESS PRODUCTS 53
Especially for business users of Commodore machines

PRODUCT SURVEY 54
Word processors for the 64

APPLICATIONS 58
The 64 helps Chivers Hartley out of a jam

Now the Commodore 64 means business

The Game's over. Wouldn't you like to increase the applications potential of your Commodore 64? Transform it from a fun family computer into a truly professional tool? Now — thanks to Handic, the world's largest creator of Commodore software — you can give a powerful new dimension to your 64's performance. We have pioneered a new program called CALC RESULT that dramatically expands the financial planning potential of your Commodore.

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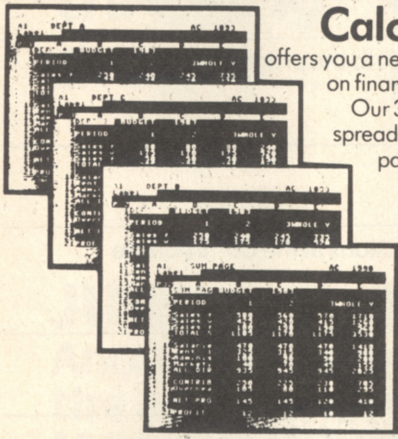

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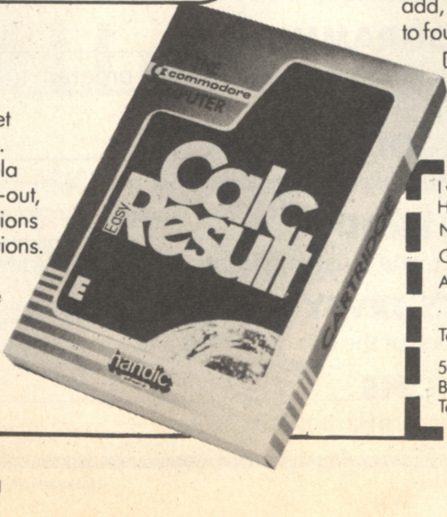

For more information contact our Advisory Centre on 0344-778800 or simply contact your local Commodore or Lightning dealer, or clip the coupon.

I would like you to send by return post further information on the Handic 64 range. CC2

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5 Albert Road, Crowthorne
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handic software Ltd

Thinking ahead

Developments at Commodore

Commodore have been offering tantalising glimpses of no less than eight new computers – a 16-bit Commodore PC, a Z8000-based machine, the C16, the 116, the 264, the V364, the 128K 8296, and the 8096-D.

However, it is not yet known when, and indeed if, all these computers will be launched in the UK. They will almost certainly undergo changes before their launch.

An early '85 launch is predicted for the 16-bit Commodore PC, a licensed copy of Bytec's IBM look-alike, the Hyperion. The Commodore version will be more compatible with the IBM. The CRT controller has been replaced with the same 6845 found in the IBM; the BIOS are completely rewritten; and there are changes in hardware.

A similar launch date is scheduled for the Z8000-based machine using the UNIX-like Coherent operating system (announced in our April issue).

On display at the Commodore show are the C16 and the 264, both featuring Basic 3.5 (like a standard Basic 2.0 with all the Toolkit and Super Expander commands built in, plus a slightly simpler disk operating system), a built-in machine language monitor and a screen windowing capability.

The 264 is expected to be launched at the Commodore Show (differing from its US equivalent and possibly under a different name), although it is unlikely that its big brother, the V364, will be seen in the UK (CCI February '84).

Also being displayed at the show is Commodore's 8296/8296D, updating the Commodore 8032/8096. The 8096-D is a version of the 8096 with integral disk drives and is likely to be launched in the UK before the end of the year.

Commodore confident

Amstrad, better known for its hi-fi units, is entering the computer market with a low-price computer – the CPC464. For just £229, Amstrad's CPC464 offers a Z80A, 64K of RAM, typewriter keyboard, integral cassette drive and monochrome monitor. If a colour monitor is preferred, the system is offered at £329.

It sounds an attractive package and many software houses are beginning to produce compatible software. However, Commodore are confident that the Amstrad launch will have little effect on the company's position as one of the leading manufacturers of micros.

Commodore's software manager, Gail Wellington, comments: "I don't think we have anything to fear. It all depends on the software available and whether they can supply the goods or not. It may well turn out to be another QL."

Commenting on the fact that a first time buyer could purchase an Amstrad system complete with cassette unit and monitor for the price of a CBM-64, Wellington says: "People don't want monitors – they all have TV sets.

"It is not necessary to speculate at such an early date. Our position is strong and we have absolutely no worries."

Cut-price controversy

Imagine Software recently announced a price reduction for all their games bringing them down to £3.95 each. Just days later the company announced that they had made the wrong decision and that their games will continue to sell at £5.50.

Imagine's change of heart is credited to the fact that a substantial demand for games would be offset by the effect it would have on the software industry.

They claim that many small software houses would be forced out of business and an ensuing price war would benefit few.

However, since that announcement, the games market has seen the emergence of two new software labels both offering games at just £1.99 – Mastertronic and Atlantis Software. Both companies feel that there is room in the market for both price ranges to exist side by side and that low-price games may also stimulate demand for games in general.

The price may be low, but Mastertronic and Atlantis both claim that the quality of their games is comparable to those currently selling at between £5 and £7.

Voicing the other side of the argument Derek Meaking, head of National Micro Centres, warns that the arrival of cut-price software could result in the British software industry sliding into mediocrity. He says: "If the rest of the industry follows suit, it will be doing far more than cutting prices – it will be cutting its own throat."

Software growth

A study just published by EIU Informatics shows that the market for microcomputer packaged software reached a value of £127 million in 1983, representing a growth of 170 per cent over 1982.

The results of the survey, of UK micro software dealers and distributors, show that 85 per cent of all software sold in 1983 is used in conjunction with micros costing less than £2,000; that is, low priced personal computers and home computers like the 64.

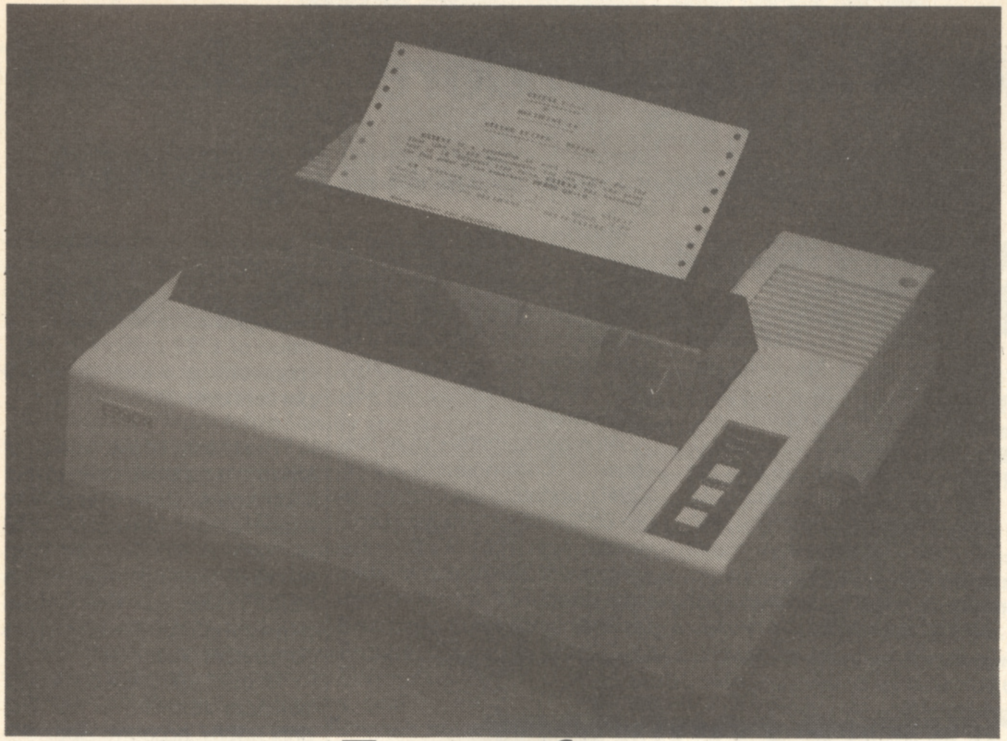
Of the 1,200 retail dealers of business software in the UK, only 150 account for the majority of sales. In the home computer category, two major high street dealers accounted for almost 20 per cent of all sales in the UK market. And as price competition among games suppliers has become stronger mail order companies are pulling out of the software business.

This analysis of the market by EIU Informatics evaluates the strength of American suppliers in the UK market, but also indicates the potential for growth in the smaller specialist market sectors where British firms are becoming well established.

The forecast growth in software sales illustrates the increasing importance of software in the purchase of micro systems. In 1981, software represented 24 per cent of the total system value, but by 1988 it will account for almost 75 per cent.

The study, entitled The Markets for Microcomputer Software in Europe, is published in five volumes. The UK volume costs £1,100 and is available from EIU Informatics, Spencer House, 27 St. James's Place, London SW1A 1NT. Tel: 01-493 6711.

PRODUCT NEWS



Epson four

Epson hope to have launched four new printers by the end of the year – two thermal models, a colour printer and a printer/plotter.

The two thermal printers are both portable and come with rechargeable batteries. The dot matrix P-40 uses thermal paper costing £95 + VAT. The P-80, a thermal transfer printer will accept both plain and thermal paper and retails at £160 + VAT.

Epson believe the JX-80 dot matrix colour printer will be the first one in the country which automatically defaults to monochrome. Costing £560 + VAT, it uses seven colours and features include high resolution graphics and 96 ASCII characters.

The HI-80 is the first colour plotter to be marketed by Epson and costs £400 + VAT. Features include eight colours and a printing as well as plotting mode.

None of the printers are directly compatible with Commodore and so Epson are selling the Centronics Parallel Interface (CPI) for £90 which will enable either the 64 or the VIC 20 to use the printers.

Contact: Epson (UK) Ltd, Dorland House, 388 High Road, Wembley, Middlesex HA9 6UH. Tel: 01-902 8892.

File it

Eastlight have introduced a new concept in computer printout filing. Their new Data Archfile range features a quick release slide mechanism designed to combine quick and efficient filing with easy access.

The files come in four colours – green, red, blue and orange – and are available in four sizes: 400 x 40 cm, 400 x 25 cm, 260 x 40 cm and 260 x 25 cm, costing £3.90, £3.72, £3.42 and £3.24 respectively.

Contact: Eastlight Ltd, Ashton Road, Denton, Manchester M34 3NA.

64 + 64K

Letco, pioneers of 64KV, the first 64K RAM module for the VIC 20, also claim to be the first company to successfully manufacture a 64K byte memory expander for the 64.

By combining the new adaptor, the 64KVA priced at $29.95 (£16.63 approximately) with the 64KV memory expander for the VIC 20 retailing at $109.95 (£61.08 approximately), the 64KC memory expander for the 64 is produced. The combination costs $139.95 (£77.75 approximately) and plugs directly into the C-64 expansion port.

The addresses from $8000 to $9FFF will have eight separate blocks of 8K locations and each block can be selected by a single poke instruction. The 64KC memory expander is only available in the US at present.

Contact: Leader Electronic Technology Company (LETCO), 7310 Wells Road, Plain City, Plain City, Ohio 43064. Tel: 614 873 4410.

Longman

Longman, the educational publishers, have launched a new range of programs for CSE students. Mathematics, Physics, Chemistry and Computer Studies are the first four titles in the series. They are available on cassette for the 64 priced at £7.95 each.

They are designed to supplement school work and each package contains five programs. The database contains important information and ideas on the subject, three of the programs concentrate on key topics and problem areas and a games program provides a chance to use the knowledge learnt. Colour graphics and sound are used to illustrate ideas.

Twelve pages of support notes accompany each program and include guidance on revision planning.

Contact: Longman Group Ltd, Longman House, Burnt Mill, Harlow, Essex CM20 2JE. Tel: 0279 26721.

Work stn

Planned Data Furniture have added a range of five thick top workstations with keyboard wells to their collection of furniture. Each desk is finished in crown veneered teak emphasizing the slanted African Walnut edges.

They are all approximately 740 mm high. Widths vary – the smallest is 600 mm wide and the largest is 1085 mm wide, costing £127 and £201 respectively.

The keyboard well is 250 mm deep and is suitable for both the 64 and the VIC-20. As it doesn't quite reach the full depth to the back of the unit, a monitor or VDU can stand at full height behind the keyboard.

Contact: Planned Data Furniture Ltd, Unit 8A, Vaughan Industrial Estate, Manchester M12 5DU. Tel: 061 231 4587.

Wizard

Bubble Bus have announced the release of their updated version of Word Wizard, a word processing system priced at £6.99.

It runs in conjunction with the Commodore 1520 printer/plotter and can be set for either 80 or 40 column print.

Contact: Bubble Bus Software, 87 High Street, Tonbridge, Kent TN9 1RX. Tel: 0732 355962.

New look

Dr Watson, following the success of Honeyfold Software have re-issued ten books from the series in a re-packaged form and reduced the prices of Basic courses to £10.50 and Assembley courses to £12.50.

Titles involved include Assembley language course for the 64 and VIC-20, beginners Basic for the 64 and Basic Adventures in Space for the VIC-20.

Contact: Honeyfold Software Ltd, Standfast House, Bath Place, High Street, Barnet, London EN5 1ED. Tel: 01-441 4130.

64 sound

Multisound synthesizer from Romik produces a wide variety of sounds including those made by the flute, piano and guitar. It comes on cassette for the 64 and costs £14.99.

Multisound can be used as a keyboard and the tunes created can be saved on tape and used for more complicated works. Both background and foreground music can be played with additional sounds created using a special effect facility.

Contact: Romik Software Ltd, 272 Argyll Avenue, Slough. SL1 4HE. Tel: 75 71535.

Logic 3

Logic 3, the Windsor and High Wycombe based software house, have signed with author Mathew Woolf for the worldwide marketing rights to what they claim to be the only multi-tasking version of the Forth language for the 64.

The new product, Logic 3 Forth, comes on disk and costs £29.95. It operates at a speed almost as fast as an assembler, but is relatively simple to program and has extensions to handle graphics, sprites and sound capabilities on the 64.

Due to its multi-tasking ability it is possible for the processor to execute one program while another is being edited. Logic 3 Forth is scheduled to be launched at the Commodore Show in June.

Contact: Logic 3, Unit 18, Wye Industrial Estate, High Wycombe, Bucks. Tel: 0825 3588.

Word pro

Atlantic Software have launched a range of word processing programs for the VIC-20 available on both tape and disk. Prices range from £11.95 to £19.95.

TOTL.TEXT.2.0 for the VIC-20 with 8K expansion controls line width, page length, margins, tabulation, justification and spacing.

TOTL.TEXT.2.5 is intended for the VIC-20 with 16K expansion and incorporates additional features such as embedded foot notes, headings and enhance characters.

The TOTL.LABEL creates address files and prints out labels. TOTL Software will operate with Commodore printers.

Contact: Atlantic Software, 18-b Thorpe Road, Kingston, Surrey KT2 5EU.

Micro command

Micro Command, a speech recognition unit for the 64, is scheduled to be launched this summer for £74.95. Micro command plugs into the back of the 64 and operates with the accompanying programs.

The cassette contains 11 files. These include a program intended to introduce the user to speech recognition and some games which have to recognise a voice before they will work. Ideas on writing personal programs using Micro Command are also included.

Contact: Orion Data Ltd, 3 Cavendish Square, Brighton, Sussex BN2 1RN. Tel: 0273 672994.

Easy read

A range of Ashton Tate computer books are to go on sale at W H Smiths, Blackwells and the Birmingham Computer Bookshops. Although none of the books specialise in the Commodore computers they do cover a number of topics relevant to anyone with a computer.

The books range from simple introductory guides for the beginner to more technical subjects such as database management. They aim to simplify personal computing and help users derive maximum benefit from the computer and software tools at their disposal. They also supplement computer education and training activities.

Clean up

To provide protection against dirt on computer equipment, Bib Audio/Video Products have introduced an anti-static spray and a diskette head cleaning kit.

The spray is highly concentrated and renders plastic and glass surfaces static free thus reducing their attraction to dust. The kit comprises a pump spray, anti-static liquid, two cloths and retails at £2.48.

The BBC-II diskette cleaner is suitable for ten average cleanings and removes potentially harmful oxide build ups. It can be used with single and dual sided disks. The pack contains disk cleaner, a bottle of cleaning fluid and costs £4.99.

Contact: Bib Audio/Video Products Ltd, Kelsey House, Wood Lane End, Hemel Hempstead, Herts HP2 4RQ. Tel: 0442 61291.

Phloopy

Phi Mag Systems anticipate a demand for a new data storage system. The present audio cassette drives are slow and the floppy disk drives are expensive, so they have designed the Phloopy. A version for the 64 is expected to be out by the end of the year and will retail at about £100.

Interchangeable cartridges are used for storing and these fit into the Phloopy drive. The 12 foot long tape in the cartridge is driven by a motor and it only takes about three seconds to file, load or save information. Errors are detected by means of a microprocessor which spots and corrects them immediately. The Phloopy is accompanied by documentation and Phi Mag claim that the transfer of text files or programs from cassette to Phloopy is extremely simple.

Contact: Phi Mag Systems Ltd, Tregoniggie Industrial Estate, Falmouth, Cornwall TR11 4RY. Tel: 0326 76060.

Gemini

More Programs...

THE COMPLETE CASH B

Business Software

Gemini
Serious Software
Cashbook

INTRODUCTION

Designed for the small to medium sized business, whether a sole trader, partnership, or limited company these programs need a Commodore 64 Microcomputer (CBM 64), an 80 or 132 column printer, and cassette or disk storage.

Each has been specially written to use the computer's huge memory and is a 'stand alone' program. However the Cash Book and Final Accounts programs also interface, to produce a superb combination pack for really serious business users, as well as practising accountants.

Each program is supported by a comprehensive, easily followed manual, and 'user friendly' screen prompts with error trapping routines, which make a specialised knowledge of accountancy unnecessary for the average user. The software is, however, capable of advanced accounting use, and in order to fully appreciate and interpret the Balance Sheet a discussion with your professional adviser or Bank Manager may be advisable.

We confidently recommend these programs to serious commercial owners of the CBM64, and hope they will enable you to operate your business on a more effective, efficient and profitable basis.

David A. Perkins BA, ACA, ATII
Director of Gemini Marketing Ltd. and partner in Perkins & Gingell, Chartered Accountants.

David J. Gingell MA (Oxon),ACA
Director of Gemini Marketing Ltd. and partner in Perkins & Gingell, Chartered Accountants

Malcolm Brook FCA
Chairman of Gemini Marketing Ltd., Business Consultant and Underwriting Member of Lloyds

Peter S. Meherne MIAP
Associate Director of Gemini Marketing Ltd. In charge of Programming

VAT FILE

Whilst this program will benefit most VAT registered businesses, it is also designed for those users who are on one of the special retailers schemes for VAT, which requires them to analyse their expenditure invoices over the various rates of VAT, in order to calculate their VAT output tax. The program will provide the following:

1. A means of recording invoices.
2. A printed copy of all invoice details.
3. Accumulated totals of different types of transactions.
4. The facility for coping with a multi-rated VAT system.
5. Information needed for the preparation of VAT returns.
6. The facility to sort and print transactions by date, invoice reference or customer/supplier name.

The package is capable of dealing with up to 100 transactions in a single batch and the different transaction types are processed in separate batches, which are then printed out as a permanent record. Cumulative totals for gross takings, VAT at standard rate etc. are stored in a data file on disk or tape which can be loaded at the start of every session to provide 'brought forward' totals for the program.

Cassette C.0813 £19.95
Disk D.0813 £24.95

Combination Packs

Designed to offer maximum value and convenience to serious business users, by combining several programs in one handy pack, together with their appropriate manuals.

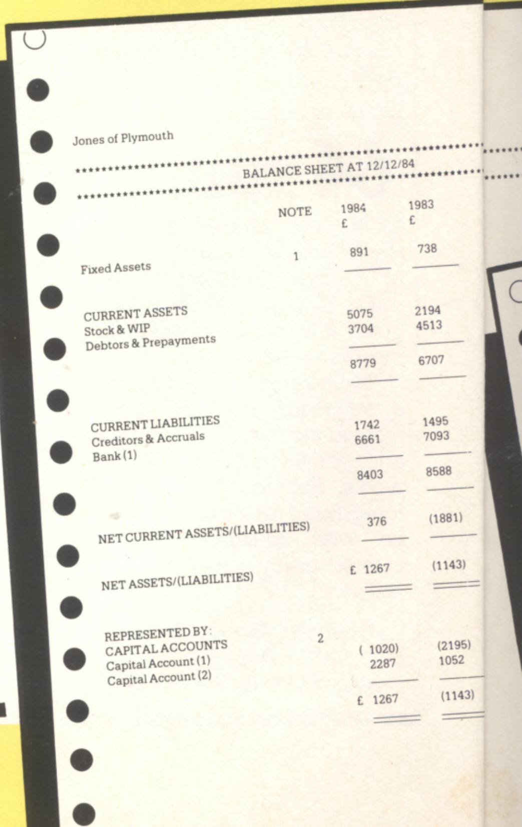
Combination Business Pack No. 1
Contains: Cash Book (including VAT file), and Final Accounts

	Normal List Price of Programs in Pack	Combination Pack Price	SAVING...
C.0818 Cassette	£119.90	£89.95	£29.95
D.0818 Disk	£129.90	£99.95	£29.95

Combination Business Pack No. 2 Contains: Cash Book (including VAT file), Final Accounts, Database, Stock Control and Mailist.

C.0819 Cassette	£179.75	£139.95	£39.80
D.0819 Disk	£204.75	£159.95	£44.80

Just a few of the many reports produced by the Cash Book Accounting System



Jones of Plymouth

BALANCE SHEET AT 12/12/84

	NOTE	1984 £	1983 £
Fixed Assets	1	891	738
CURRENT ASSETS			
Stock & WIP		5075	2194
Debtors & Prepayments		3704	4513
		8779	6707
CURRENT LIABILITIES			
Creditors & Accruals		1742	1495
Bank (1)		6661	7093
		8403	8588
NET CURRENT ASSETS/(LIABILITIES)		376	(1881)
NET ASSETS/(LIABILITIES)		£ 1267	(1143)
REPRESENTED BY:			
CAPITAL ACCOUNTS	2		
Capital Account (1)		(1020)	(2195)
Capital Account (2)		2287	1052
		£ 1267	(1143)

...More Programs ...More Programs...

BOOK ACCOUNTING SYSTEM FOR YOUR COMMODORE 64!

CASH BOOK (includes VAT file program 0813)

This is a program of enormous scope which allows the CBM64 to be used as a powerful business tool, taking the drudgery out of book keeping, and producing accurate and comprehensive management information.

In its simplest form the program will replace your Cash and Petty Cash books BUT Gemini's program, in effect, does much more. In addition to recording cash and bank transactions, the program will allow you to enter credit sales and purchases, and for all of these entries it will automatically complete the double entry routines, to ensure that your records are always in balance.

Sales and Purchase ledger control accounts are included, which makes the program ideal for integration with an existing manual sales or purchase ledger system.

The program also includes the following features:

1. Balance at Bank for up to 5 separate Bank Accounts.
2. Petty Cash in hand for up to 3 separate Cash Accounts.
3. A listing of all nominal account titles (maximum 199), most of which are user definable).
4. Monthly transaction summaries and departmental analyses of sales and purchases.
5. VAT memo account balances (sales/net purchases), and VAT accounts
6. Batch printouts of all transactions entered in current program run.
7. Total debtors and creditors, sales, overheads and Trial Balance.

The program is therefore a complete 'stand alone' accounting software package, ideal for both business users, and practising Chartered Accountants, since an infinite number of different Cash Books may be kept on a single CBM64.

A full audit trail of all data entered in the program is produced and a journal entry routine is incorporated to facilitate adjustments to individual nominal accounts, prior to producing a final Trial Balance. The latter interfaces automatically with Final Accounts program C.0806, so that a Profit and Loss Account and Balance Sheet can be prepared from data held in the Cash Book program.

Cassette C.0805 £59.95
Disk D.0805 £64.95

FINAL ACCOUNTS

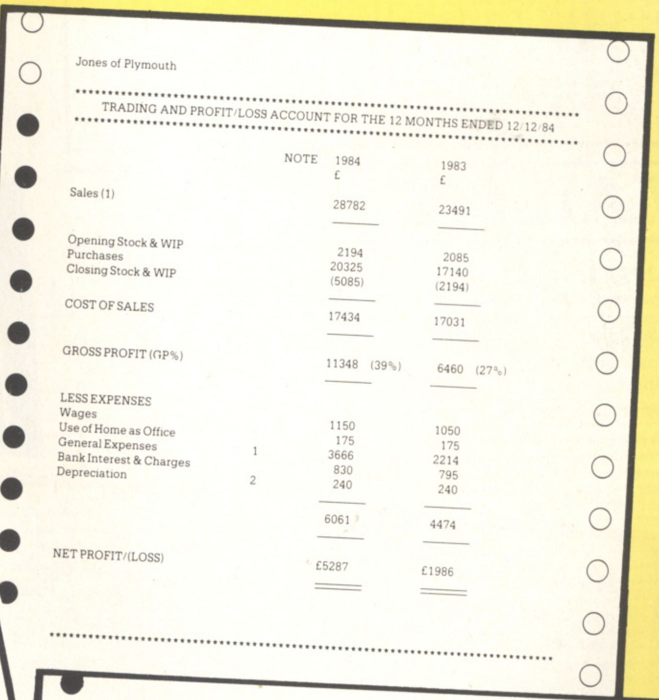
This program is designed to produce a Trading and Profit & Loss Account and Balance Sheet, either from the final Trial Balance produced by Cash Book program 0813 or from any other Trial Balance making it a truly stand alone 'Final Accounts' program.

The facility to produce these documents quickly, accurately, and regularly is of enormous help in running any business, large or small, since one shows the true profitability achieved, and the other the exact strength of the business in terms of assets and liabilities.

The program also allows insertion of budget or comparative figures which can be shown alongside the actual figures, together with notes to the accounts, and the opening Trial Balance for the following period.

Whether used by businessman or practising Accountants, this program allows the CBM64 to be used as a real business computer producing vital information for decision makers with enormous ease and accuracy.

Cassette C.0806 £59.95 *Disk D.0806 £64.95*



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Jones of Plymouth

*******************************************************************
   TRADING AND PROFIT/LOSS ACCOUNT FOR THE 12 MONTHS ENDED 12/12/84
*******************************************************************

                              NOTE   1984            1983
                                     £               £
Sales (1)
                                     28782           23491
                                     -----           -----

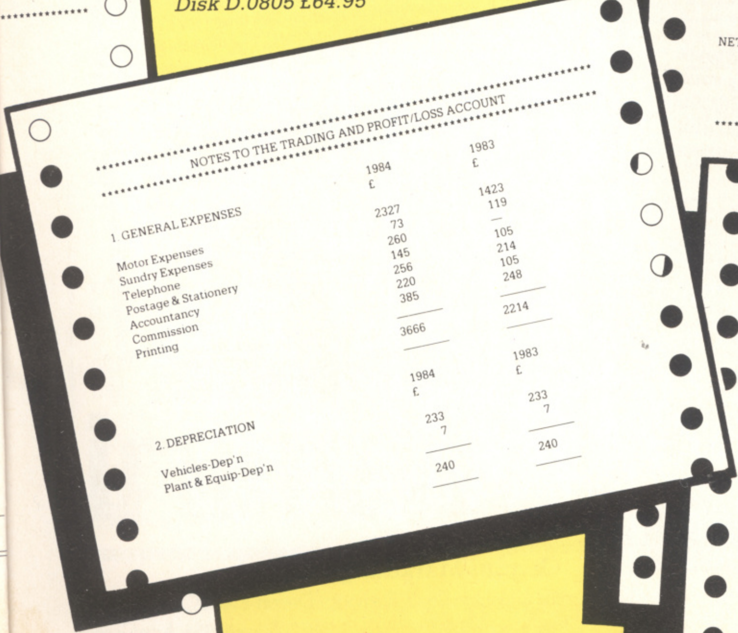
Opening Stock & WIP                   2194            2085
Purchases                            20325           17140
Closing Stock & WIP                  (5085)          (2194)
                                     -----           -----
COST OF SALES
                                     17434           17031
                                     -----           -----

GROSS PROFIT (GP%)                   11348  (39%)     6460  (27%)
                                     -----           -----

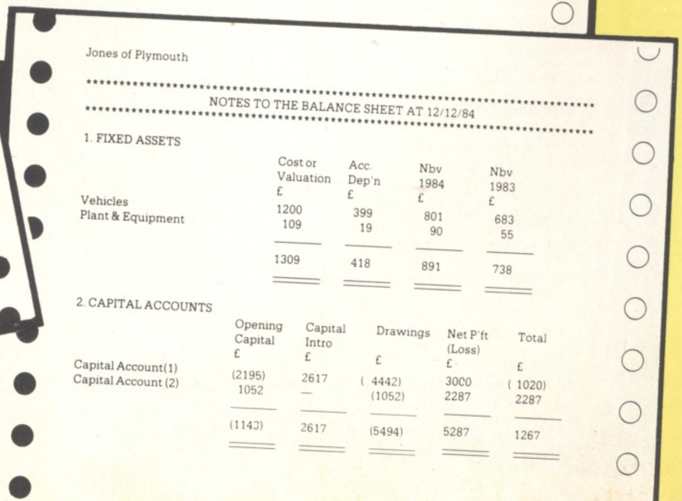
LESS EXPENSES
Wages                                 1150            1050
Use of Home as Office                  175             175
General Expenses                1     3666            2214
Bank Interest & Charges                830             795
Depreciation                    2      240             240
                                     -----           -----
                                      6061            4474
                                     -----           -----

NET PROFIT/(LOSS)                    £5287           £1986
                                     =====           =====

*******************************************************************
```



```
****************************************************
        NOTES TO THE TRADING AND PROFIT/LOSS ACCOUNT
****************************************************
                                  1984        1983
                                  £           £
1. GENERAL EXPENSES                           1423
                                  2327         119
Motor Expenses                      73          —
Sundry Expenses                    260         105
Telephone                          145         214
Postage & Stationery               256         105
Accountancy                        220         248
Commission                         385        ----
Printing                          ----        2214
                                  3666        ----
                                  ----
                                              1983
                                  1984        £
                                  £
                                               233
2. DEPRECIATION                    233           7
                                     7        ----
Vehicles-Dep'n                    ----         240
Plant & Equip-Dep'n                240        ----
                                  ----
```



```
Jones of Plymouth

**********************************************************************
              NOTES TO THE BALANCE SHEET AT 12/12/84
**********************************************************************
1. FIXED ASSETS
                         Cost or     Acc.       Nbv        Nbv
                         Valuation   Dep'n      1984       1983
                         £           £          £          £
Vehicles                 1200         399        801        683
Plant & Equipment         109          19         90         55
                         ----        ----       ----       ----
                         1309         418        891        738
                         ====        ====       ====       ====

2. CAPITAL ACCOUNTS
                     Opening   Capital   Drawings   Net P'ft   Total
                     Capital   Intro                (Loss)
                     £         £         £          £          £
Capital Account(1)   (2195)    2617      ( 4442)    3000       ( 1020)
Capital Account (2)   1052     —          (1052)    2287        2287
                     ------    ----      ------     ----       ------
                     (1143)    2617      (5494)     5287        1267
                     ======    ====      ======     ====       ======
```

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STOCK CONTROL

A superb program which makes extensive use of machine code to optimise the use of the computer's memory and greatly improve speed.

Up to 220 stock records may be held on each file with details including stock reference code, description, supplier name, quantity in stock, cost price, sale price, etc.

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This program will take much of the tedium out of stock control and save time and money.

Cassette C.0802 £19.95   Disk D.0802 £24.95

TYPICAL STOCK CONTROL REPORTS

```
****************************************************************************
REC  STOCK NO   DESCRIPTION                UNIT QTY    NO. IN    COST     SELL

1    62—117     CALCULATOR (TI-54)         SINGLE        5.00   13.02    26.04
2    20—237     CALCULATOR (TI-59)         SINGLE        0.00   70.00   130.39
3    54—827     CODING CARDS               3            10.00    0.75     1.51
4    19—857     PRINTER CRADLE             SINGLE        1.00   82.56   165.17
5    67—374     MEMORY MODULE              SINGLE        5.00    9.56    18.77
6    12—867     SOLVENT CLEANER            320ML        10.00    0.73     1.34

                 RECORD NO. 1                              RECORD NO. 2

STOCK NUMBER:    62—117               STOCK NUMBER:    20—237
DESCRIPTION:     CALCULATOR (TI-54)   DESCRIPTION:     CALCULATOR (TI-59)
UNIT QUANTITY:   SINGLE               UNIT QUANTITY:   SINGLE
QTY. IN STOCK:    5.00                QTY. IN STOCK:    0.00
COST PER UNIT:   13.02                COST PER UNIT:   70.00
SELL PER UNIT:   26.04                SELL PER UNIT:  130.39
MINIMUM STOCK:    2.00                MINIMUM STOCK:    1.00
RE-ORDER QTY:     5.00                RE-ORDER QTY:     2.00
SUPPLIER NAME:   TEXAS INSTRUMENTS    SUPPLIER NAME:   TEXAS INSTRUMENTS
```

MAILIST

A dedicated database to allow for manipulations of names and addresses and other data. Gemini's unique 'searchkey' system gives you a further ten 'user-defined parameters' to make your own selections. Features include the facility to find a name or detail when only part of the detail is known, and to print labels in a variety of user specified formats.

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A really excellent rewrite for the 64 of Gemini's famous program for the BBC Micro — now enhanced with extra features... Budget for all aspects of household and personal expenditure for each month of the year, and then record and compare actual expenditure as it happens... Complete interactive bank account database with the ability to automate standing order debits... Credit cards supported... Full printer options... Graphic plotting facility to display levels and trends of expenses, at a glance... Highly recommended for putting your 64 to serious work!

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3. Invaluable software support is available... normally this service is offered only with software costing many times the Gemini price.

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Gemini Stock Control 'Jersey Evening Post', 17 January 1984

"Remarkable Software, friendly and well designed, a pleasure to use" *Gemini Cash Book, 'The Scotsman', 12 October 1983*

"Well documented, easy to load, excellent screen display"
Gemini Spreadsheet Analysis, 'Home Computing Weekly' 27 September 1983

"A very professional piece of software"
Gemini Mailist 'Which Micro' February 1983

"Will enable business people with a moderate grasp of accounting principles to produce a set of figures that will satisfy both the Bank Manager and the Tax man"
Gemini Cash Book 'Micro User' August 1983

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Micro music

This month we recap on our Music Project so far and publish a program that displays the keyboard on the screen and enables change to the envelope parameters

Summary Of Project So Far

So far we have connected a four-octave keyboard to the 64 via an interface that we created (December 1983). Also in this article we gave a simple machine code routine to scan the keyboard and play the notes. This routine was of the simplest form with no envelopes and a maximum sustain level.

There was also a simple Basic program that produced a 'vibrato' effect using the volume register.

In the May edition we produced the updated and improved version of the machine code playing routine. This routine now incorporates full use of the SID envelopes. This routine was to replace the previous one.

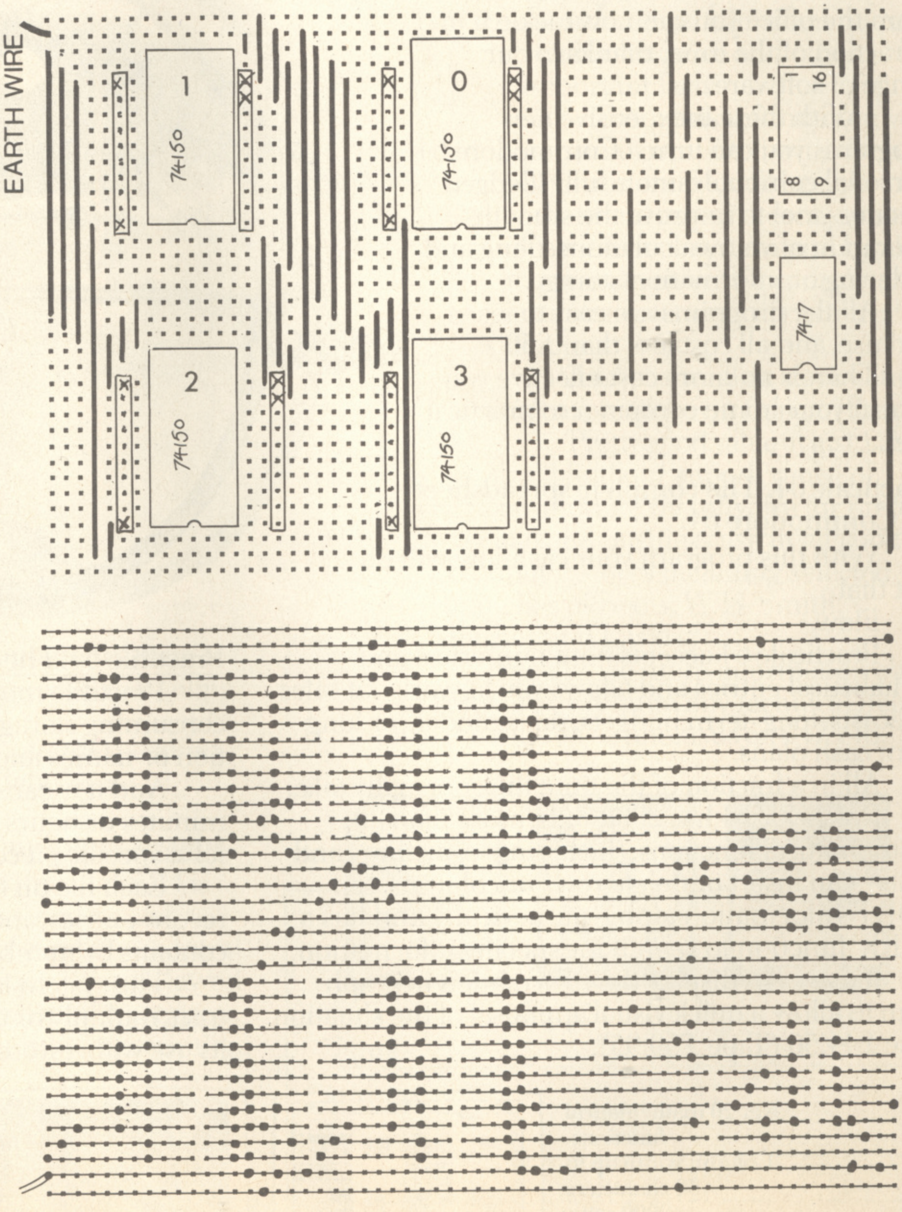
In this issue, we have a Basic program that displays the keyboard on the screen using user-defined characters with arrows pointing to the keys presently being held down. In addition to this, the envelope parameters may now be changed by using the keys 1-6 to increase the values or shifted 1-6 to decrease the values.

Note that, for example, if the attack is at 15, pressing key 1 will set the value to 0. This is true of the other values as well. The pulse width is increased or decreased by 100 with key 6 or shifted key 6.

To remember which key controls which value, the number is displayed beside the value on the screen.

This program is to be loaded and run after the program from last month has been loaded and run.

Finally, here is the corrected diagram (which was wrong due to problems with the artwork) of the interface board – a photograph of which was published in the May issue.



Top side and underside of interface as set up on vero board.

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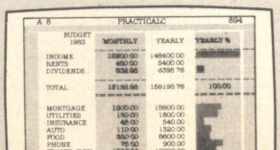

```
A 8                 PRACTICALC                  894
  BUDGET
   1983      MONTHLY      YEARLY     YEARLY %

INCOME       12200.00    146400.00
RENTS          450.00      5400.00
DIVIDENDS      532.98      6395.76

TOTAL        13182.98    158195.76    100.00

MORTGAGE      1300.00     15600.00
UTILITIES      150.00      1800.00
INSURANCE       45.00       540.00
AUTO           110.00      1320.00
FOOD           550.00      6600.00
PHONE           75.00       900.00
TRAVEL & EN   1000.00     12000.00

TOTAL         3230.00     38760.00    100.00

DISPOSABL     9952.98    119435.76
      8           1            2           3
```

Practifile 64. The database for Commodore 64.

Practifile means an end to bulky and time-consuming storage of files, client or patient information or names and addresses.

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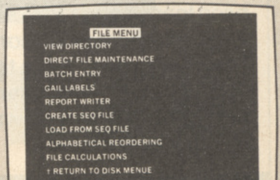
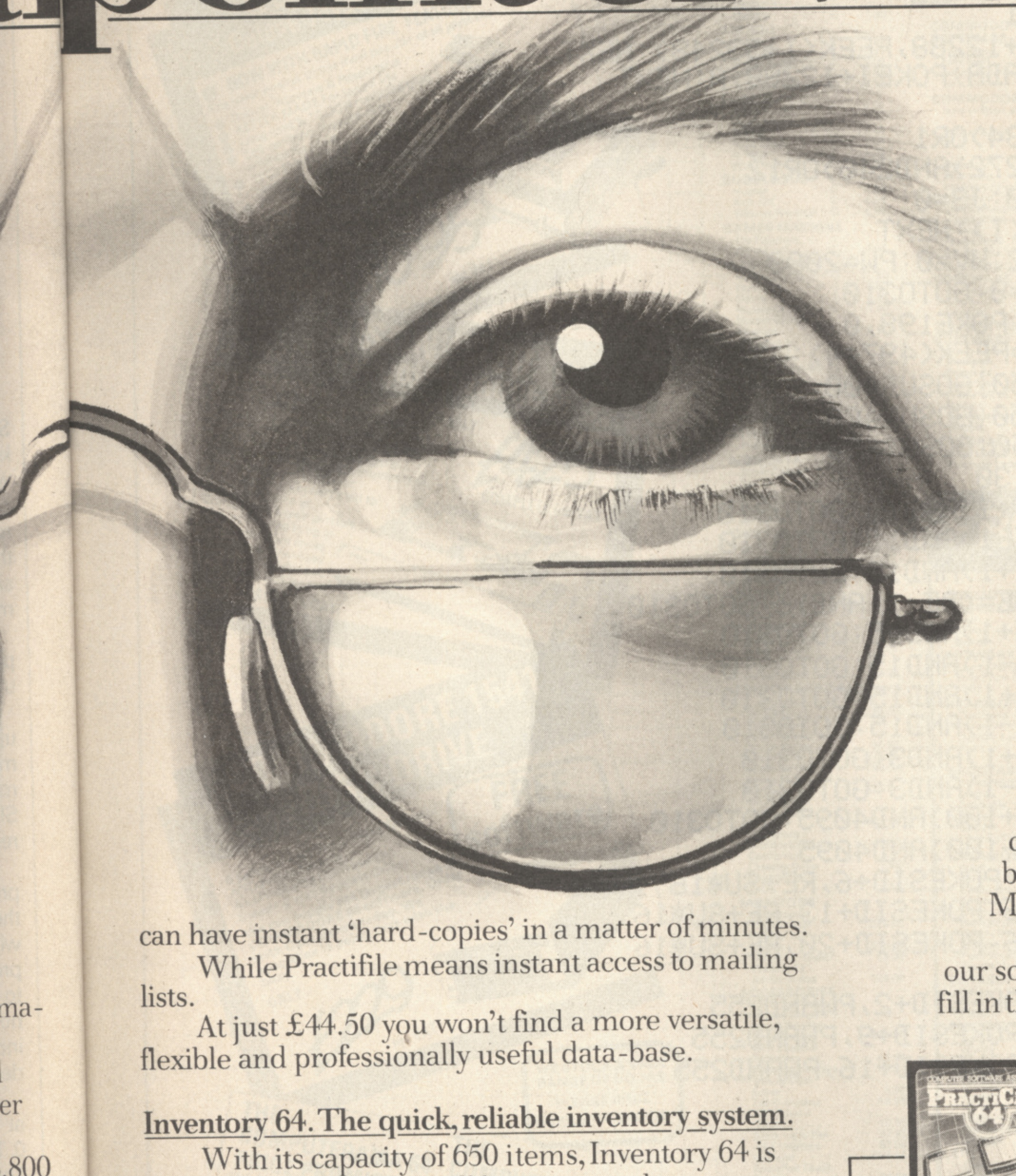
The system is so flexible that you can add, subtract, multiply or divide within individual files, while its use with a word-processing system means that you

Sorts files by number or letter in less than one second. Fully compatible with Practicalc 64.



```
        FILE MENU
VIEW DIRECTORY
DIRECT FILE MAINTENANCE
BATCH ENTRY
GAIL LABELS
REPORT WRITER
CREATE SEQ FILE
LOAD FROM SEQ FILE
ALPHABETICAL REORDERING
FILE CALCULATIONS
↑ RETURN TO DISK MENUE
```

software from a
l point of view.



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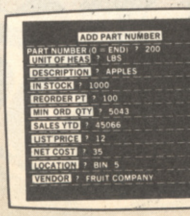
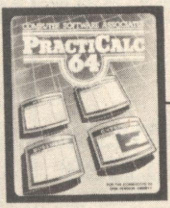
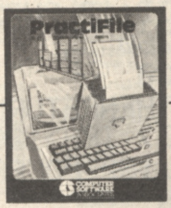
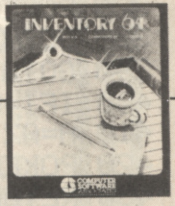


```
ADD PART NUMBER
PART NUMBER (0 = END)  ?  200
UNIT OF HEAS  ?  LBS
DESCRIPTION  ?  APPLES
IN STOCK  ?  1000
REORDER PT  ?  100
MIN ORD QTY  ?  5043
SALES YTD  ?  45066
LIST PRICE  ?  12
NET COST  ?  35
LOCATION  ?  BIN  5
VENDOR  ?  FRUIT COMPANY
```







Name ______________________________

Address ______________________________

____

____

PRACTICORP

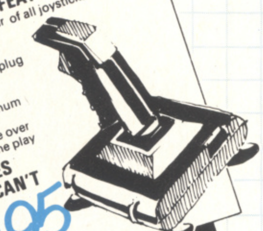
Goddard Road, Whitehouse Industrial Estate, Ipswich IP1 5NP. Tel: 0473 462721

```
10 POKE56,48:POKE52,48:POKE650,128
20 POKE56334,PEEK(56334)AND254
30 POKE1,PEEK(1)AND251
40 FORI=0TO2047:POKEI+12288,PEEK(I+53248):NEXT
50 FORI=1024TO1079:READA:POKEI+12288,A:NEXT
60 POKE1,PEEK(1)OR4
70 POKE56334,PEEK(56334)OR1
80 POKE53272,(PEEK(53272)AND240)OR12
90 DIMA%(49):J1=0:J2=0:J3=0
100 FORI=0TO49:READA%(I):NEXT
110 GOSUB510:SID=54272:WV=0:PW=2000
120 AT=9:DE=0:SU=0:RE=0:GOTO310
130 L1=J1:L2=J2:L3=J3:POKE198,0
140 J1=PEEK(49743):J2=PEEK(49744):J3=PEEK(49745)
150 I=J1:LI=L1:GOSUB450:GOSUB400
160 I=J2:LI=L2:GOSUB450:GOSUB400
170 I=J3:LI=L3:GOSUB450:GOSUB400
180 GETA$:IFA$=""THEN130
190 IFA$="1"THENAT=(AT+1)AND15:GOTO310
200 IFA$="!"THENAT=(AT-1)AND15:GOTO310
210 IFA$="2"THENDE=(DE+1)AND15:GOTO310
220 IFA$=CHR$(34)THENDE=(DE-1)AND15:GOTO310
230 IFA$="3"THENSU=(SU+1)AND15:GOTO310
240 IFA$="#"THENSU=(SU-1)AND15:GOTO310
250 IFA$="4"THENRE=(RE+1)AND15:GOTO310
260 IFA$="$"THENRE=(RE-1)AND15:GOTO310
270 IFA$="5"THENWV=(WV+1)AND3:GOTO310
280 IFA$="%"THENWV=(WV-1)AND3:GOTO310
290 IFA$="6"THENPW=(PW+100)AND4095:GOTO310
300 IFA$="&"THENPW=(PW-100)AND4095
310 POKESID+5,DE+AT*16:POKESID+6,RE+SU*16
320 POKESID+12,DE+AT*16:POKESID+13,RE+SU*16
330 POKESID+19,DE+AT*16:POKESID+20,RE+SU*16
340 POKE49742,2↑(WV+4)
350 POKESID+3,PW/256:POKESID+2,PWAND255
360 POKESID+10,PW/256:POKESID+9,PWAND255
370 POKESID+17,PW/256:POKESID+16,PWAND255
380 GOSUB760
390 GOTO130
400 IFI=0THENRETURN
410 A=A%(I):IFA>1200THEN440
420 POKEA,132:POKEA+1,133
430 RETURN
440 POKEA,134:RETURN
450 IFLI=0THENRETURN
460 A=A%(LI)
```

Computerama 64

the source

QUICKSHOT II
Deluxe Joystick Controller



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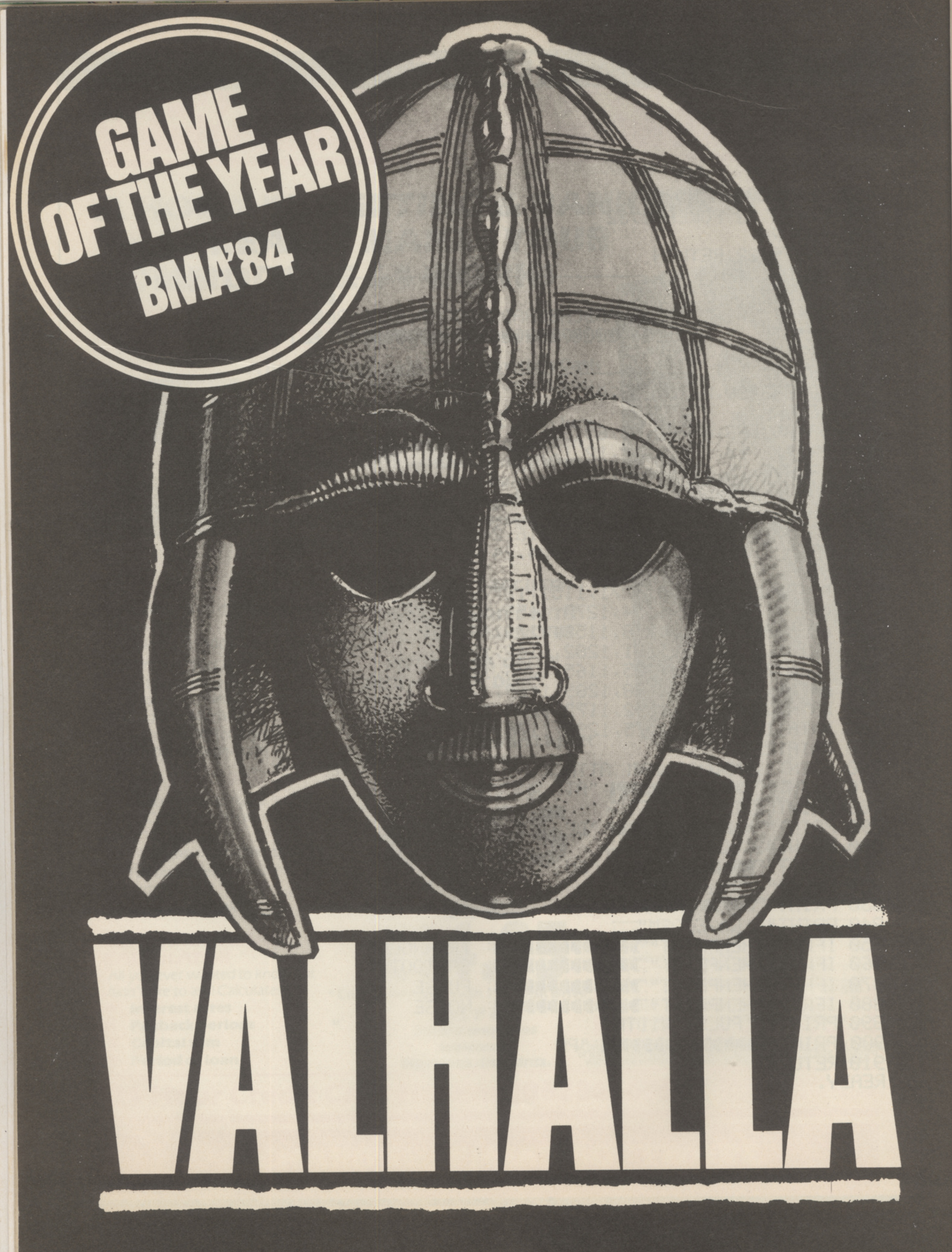
```
470 IFA>1200THEN500
480 POKEA,32:POKEA+1,32
490 RETURN
500 POKEA,32:RETURN
510 PRINT"▯▩▩       ◣┌──────────────────────────────┐"
520 PRINT"       │▩                             ◣│"
530 PRINT"       │▤▩CABCAABCABCAABCABCAABCABCAAB@◣│"
540 PRINT"       │▤▩@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@◣│"
550 PRINT"       │▩                             ◣│"
560 PRINT"       └──────────────────────────────┘▤"
570 POKE53280,0:POKE53281,0
580 RETURN
590 DATA63,63,63,63,63,63,63,63
600 DATA12,12,12,12,12,12,12,12
610 DATA15,15,15,15,15,15,15,15
620 DATA60,60,60,60,60,60,60,60
630 DATA0,0,0,0,0,6,3,0
640 DATA192,192,192,192,192,216,240,192
650 DATA24,126,219,24,24,24,24,24
660 STOP
670 DATA0,1270,1150,1271,1151,1272,1273
680 DATA1153,1274,1154,1275,1155,1276
690 DATA1277,1157,1278,1158,1279,1280
700 DATA1160,1281,1161,1282,1162,1283
710 DATA1284,1164,1285,1165,1286,1287
720 DATA1167,1288,1168,1289,1169,1290
730 DATA1291,1171,1292,1172,1293,1294
740 DATA1174,1295,1175,1296,1176,1297
750 DATA1298
760 PRINT"▩▩▩▩▩▩▩▩▩▩▩▩1 ATTACK                       "
770 PRINT"▯▶▶▶▶▶▶▶▶▶▶▶▶▶▌:"AT
780 PRINT"2 DECAY                                  "
790 PRINT"▯▶▶▶▶▶▶▶▶▶▶▶▶▶▌:"DE
800 PRINT"3 SUSTAIN                                "
810 PRINT"▯▶▶▶▶▶▶▶▶▶▶▶▶▶▌:"SU
820 PRINT"4 RELEASE                                "
830 PRINT"▯▶▶▶▶▶▶▶▶▶▶▶▶▶▌:"RE
840 PRINT"5 WAVEFORM"
850 IFWV=0THENPRINT"▯▶▶▶▶▶▶▶▶▶▶▶▶▶▌: TRIANGLE"
860 IFWV=1THENPRINT"▯▶▶▶▶▶▶▶▶▶▶▶▶▶▌: SAWTOOTH"
870 IFWV=2THENPRINT"▯▶▶▶▶▶▶▶▶▶▶▶▶▶▌: PULSE   "
880 IFWV=3THENPRINT"▯▶▶▶▶▶▶▶▶▶▶▶▶▶▌: NOISE   "
890 PRINT"6 PULSE WIDTH                            "
900 PRINT"▯▶▶▶▶▶▶▶▶▶▶▶▶▶▌:"PW
910 RETURN
READY.
```


GAME OF THE YEAR
BMA'84
VALHALLA

PROJECT

Sight for a 64

This month we show you a cheap way to digitise a photograph using a 64 and your printer

How wonderful it would be if one could simply convert a photograph or other image into data which could then be reconstructed and displayed on the screen. This problem has a fairly simple solution. To digitise a photograph requires two components – the first is a light sensor to detect the intensity of incoming light and the second is a scanning mechanism to move the light sensor across the image to be digitised.

For the light sensor we used a small Cadmium Sulphide Photocell attached to the analog input channel of the 64. For the scanning mechanism the picture to be digitised was mounted on a length of sprocketed paper fed through a 3022 printer and then glued together to form a loop. By using the line feed the image could be scanned under partial computer control.

The light sensor circuit is very simple and can be built for less than £1, the circuit is shown in Fig 1. The way the circuit is connected to Control Port 2 is shown in Fig 2. The light sensor used was obtained from Radio Shack and has an optically active area of only about 3mm diameter, this small size is essential for good resolution digitisation. An optical fibre light guide could be used to improve this resolution, but for most applications a 3mm resolution is adequate.

The loop of paper in the printer to which the image is attached is moved using the line feed command. The 3022 has the useful feature of being able to vary the line feed paper increment. This allows one to select the appropriate digitisation step size.

The Photocell is mounted on a bar traversing the paper and about 2mm from its surface. It is essential that there is a good source of light directly above the printer. The bar and Photocell mounting are constructed in such a manner that it can be manually moved in a horizontal direction across the paper. The image is thus scanned under computer control one vertical stripe at a time, the Photocell is then moved manually by the digitisation increment and the process repeated.

```
10 C=12*4096:DIMA%(50,50)
20 FORI=0TO63:READA:POKEC+I,A:NEXT
30 B$="■■■■■■■":REM 'GRN'WHT'LGR'
  'MGR'DGR'BLK'RED'
40 PRINT"⊐";:D=0
50 REM
60 REM ADJUST PRINTER LINE DENSITY TO
70 REM 8 LINES PER INCH
80 REM
90 OPEN6,4,6:PRINT#6,CHR$(18):CLOSE6
100 REM
110 REM READ IN A LINE
120 REM
130 GOSUB270
140 REM
150 REM GET KEY PRESS, IF 'D' THEN SEND
160 REM DATA TO DISK FILE AND END. IF
170 REM ' ' DO NEXT.
180 REM
190 GETC$:IFC$<>" "ANDC$<>"D"THEN190
200 IFC$=" "THEN130
210 GOTO400
220 REM
230 REM READ IN ONE COLUMN OF PICTURE
240 REM AND DISPLAY COLOURED 'ROUGH'
250 REM PICTURE
260 REM
270 OPEN4,4
280 FORI=0TO50
290 PRINT#4
300 REM
310 REM PAUSE TO ALLOW TRUE READING
320 REM
330 FORJ=0TO300:NEXT
340 SYSC:P2=PEEK(C+258)
350 PRINTLEFT$(B$,((P2+2)/6)-1)"▨ ■";
    :A%(I,D)=P2
360 NEXT:D=D+1:PRINT:CLOSE4:RETURN
370 REM
380 REM SEND DATA TO DISK FILE AND END
390 REM
400 OPEN2,8,2,"@0:PIC,S,W"
410 FORJ=0TOD-1:FORI=0TO38
420 PRINT#2,CHR$(A%(I,J));:NEXT:NEXT
430 CLOSE2:END
440 REM
450 REM DATA FOR M/C ANALOG PORT READER
460 REM (FROM PROGRAMERS REFERENCE GUIDE)
470 REM
480 DATA162,1,120,173,2,220,141,0,193,169,192,141,2,220,169
490 DATA128,141,0,220,160,128,234,136,16,252,173,25,212,157
500 DATA1,193,173,26,212,157,3,193,173,0,220,9,128,141,5,193
510 DATA169,64,202,16,222,173,0,193,141,2,220,173,1,220,141
520 DATA6,193,88,96
READY.
```

Here is the program that reads the data from the eye and stores it away

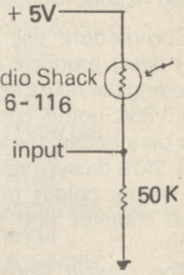


Fig 1

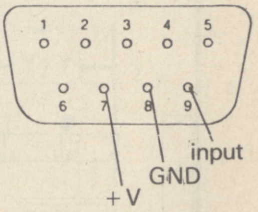


Fig 2

Commodore Show

With the Fifth International Commodore Show approaching fast, we provide a floor plan and list of exhibitors and reveal some of the attractions of the show. See you there!

Owing to the success of last year's show, the Fifth International Commodore show will be held in two venues this year – London's Novotel June 7-9 and the Leeds Exhibition Centre September 27-29. It's a must for anybody with an interest in Commodore and the organisers are expecting a turnout of more than 40,000 visitors.

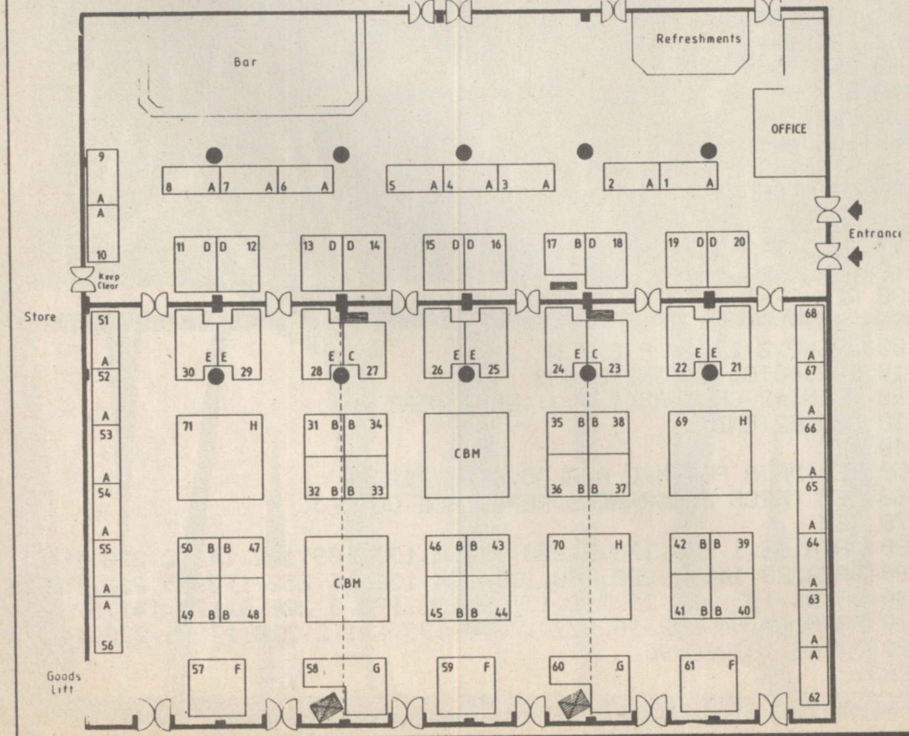
Commodore will be displaying all their latest products at the June show including the new Commodore 16, C264 and V364 home computers plus five new peripherals; the SFS 481 disk drive, DPS 1101 daisywheel printer, MCS801 dot matrix colour printer, 1703 colour video monitor and the 1531 cassette unit.

The newest Commodore business systems will also be introduced, including the Commodore 128K 8296 and the 8096D (a version of the 8096 with integral disk drives), updating the 8032 and 8096. In addition, two products launched at the April Hanover Fair – the Commodore PC and the Commodore Z8000 will be making their first appearance in the UK.

As with last year's show, exhibition space will be divided into two parts – business systems and applications upstairs and home and recreational computing downstairs. Together the exhibitors will present a comprehensive selection of Commodore compatible peripherals, software and associated products.

To help you find your way round the show, we have published a floorplan and a list of all exhibitors.

QUEEN MARY SUITE – FLOOR PLAN



As well as the exhibitors' attractions, there will be a number of other events providing additional interest and entertainment.

Radio Luxembourg have a place in the Exhibition Hall and will be appearing throughout the three days of the show.

Various guest personalities have been invited to the show and include famous sportsmen and TV stars such as Patrick Moore who will be demonstrating the Commodore Astronomy Program on the 64.

Software designer Jim Butterfield and a number of other computer experts will also be making guest appearances.

Games and competitions will be held throughout the show and for those who enjoy a good contest, the Business Simulation Challenge should provide a stimulating change from arcade games, offering the chance to put your wits against one another with the latest sophisticated business game from Commodore. In fact, a special area has been set aside for the arcade game enthusiasts.

Two seminars on a number of interesting topics will run between 4pm and 6pm every day by the Independent Commodore Product User Group (ICPUG). The organisers hope that the audience will participate in these debates.

Live demonstrations of Compunet, an armchair shopping service will be of interest to 64 owners in possession of a modem.

Finally, a few of the entries to the Commodore International Computer Art Challenge will be on show and although the official closing date for entries was June 1, a few entry forms will be available for anyone who thinks they can design a picture in under three days! The results will be announced in our August issue.

There will be something of interest for every Commodore user, but don't worry if you can't get there. Next month we will be featuring a full report on all the news from the show.

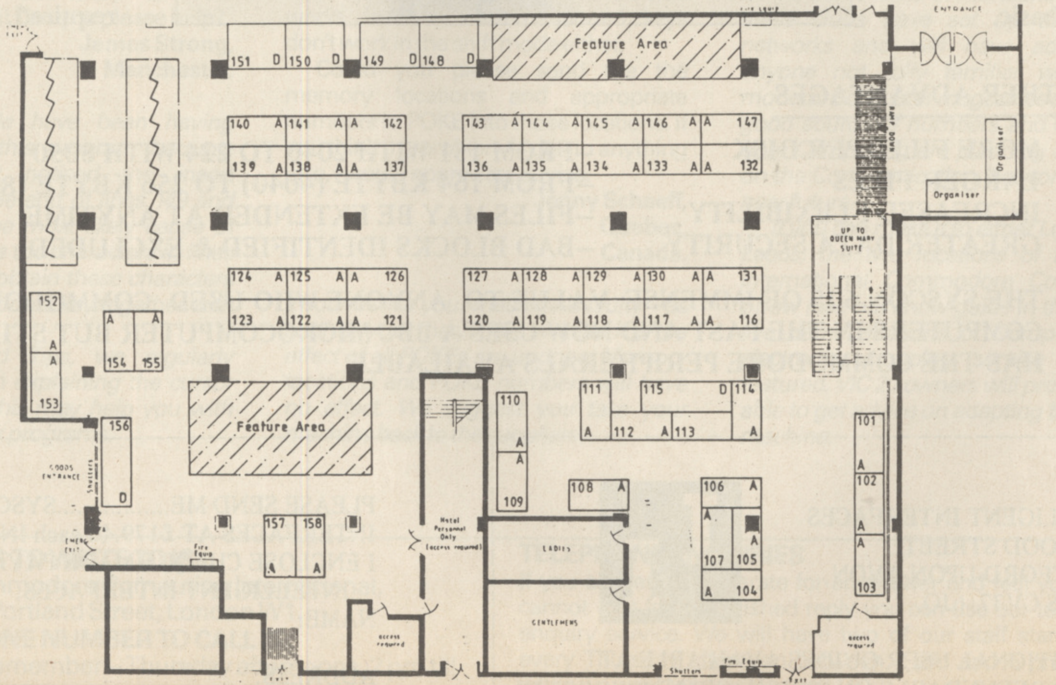
Queen Mary Suite (Business Systems and Applications)

Adcomp (UK) Ltd	H71
Anagram	D19
A.P.S. Microsystems	B37
Automation Facilities	A5
Beaumont Summer Camps	A62
B. O'Hara Associates	B34
Commodore Horizons	D20
Dataview Wordcraft	B35
3D Digital Design	A66
Electronic Aids	A2
Granada Publications	A54
Handic	D13
Honeyfold	E25
ICPUG	A56/55
I.D.A. (provisional)	C23
Impex	A65
J.C.L.	C27
MC2	B38
Micro Applications	B43
Micro Simplex	A51/52/53
Mills Associates	B48
Oxford Computer Systems	E21
Pegasus	F61
Precision Software	H69
Quick Count	A68
Saxon Computing	A1
Small Systems Engineering	A64
SM Software UK	H71
SM Software Scandinavia	H71
Software for All	A67
Supersoft	D18
Tamsey	B31
Thompson Cook	B36
Tirith	B33

Exhibition Hall (Home and Recreational Computing)

Adamsoft	A111
Adman	A139
Anirog Software	A137/138/141/142
A.S.K.	A128
Audiogenic	A101/102
Bubble Bus	A131/116
Cambre Sound	A103
Computer Bookshop	A133
Commodore Computing International	A117/118
Commodore User	A113/114
Currah	A130
DAMS (provisional)	A112
Duckworth	A147
Galactic Software	A129
Hago	A144
Interceptor	A121/122/123/124/125/126
Logic Sales (provisional)	A140
Melbourne House	A145
Merlin	A132
Micro Power	A152/153
Mirrorsoft	D115
M.T.C.	A127
Paramount (provisional)	A108
Personal Peripherals (U.S.A)	D149/148
Precision Software	A146
Quicksilver	D156
Radio Luxembourg	A104/105/106/107
RAM	A134
Romik	A154/155
Stack	A109/110
Stonechip Electronics	A157/158
Supersoft	A143
Viza	A135/136
Vulcan	A119

EXHIBITION HALL – FLOOR PLAN


Feature Area
Entrance
Fire Exit
Organiser
Organiser
Up to Queen Mary Suite
151 D 150 D 149 D 148 D
140 A 141 A A 142
139 A 138 A A 137
143 A 144 A 145 A 146 A A 147
136 A 135 A 134 A 133 A A 132
124 A 125 A A 126
123 A 122 A A 121
127 A 128 A 129 A 130 A A 131
120 A 119 A 118 A 117 A A 116
152 A A 153
A 154 155
Feature Area
156 D
Goods Entrance
Shutters
Emerg Exit
Fire Equip
157 158 A A
Hotel Personnel Only (access required)
110 A A 109
111 A 112 115 A 113 D 114 A
108 A
106 A A 107 105 A 104
101 A 102 A A 103
Ladies
Gentlemen
Access required
Access required
Exit
Shutters
Fire Equip
Exit

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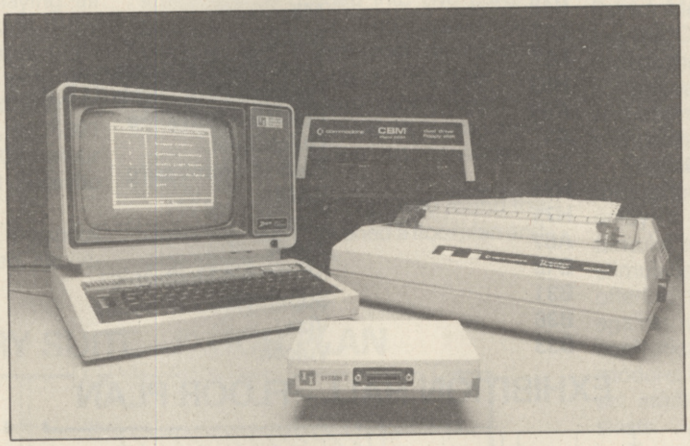

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LETTERS

Dear Sir
At last! Someone admits to the fact that there might possibly be female programmers (The Cult of '84 Vol 2 No 11). Understanding computing has nothing whatsoever to do with age, sex or circumstances. It is the ability to think in a certain way – De Bono calls it Lateral Thinking – working out the solution to a problem clearly in the mind before action.

I began to teach myself on a VIC 20 two years ago. I now have a 64, and although I don't work for a large UK software company (yet), I not only write M/C utilities, educational and games programs, but I run my own software house, organise the local computer club and give lessons (mostly to men) in BASIC and machine code.

Programmers are not necessarily pale-faced youths hunched over hot 64's until 3 am or mathematics geniuses with honours degrees. I have six 'O' levels and two kids – learning was simply a case of enthusiasm and many frustrating hours of practice.

Look out Jeff Minter, Mo is coming!

Mo Warden,
Walsall,
West Midlands.

Dear Sir
I have been having problems with Breakout (a program in Vol 2 No 11). After loading and running the program, it started and ran until I got through the wall of bricks. The ball just carried on going over the court top and the program crashed! Can you please help?

James Strong,
Manchester.

A lot of people have been having problems with this program because they have not noticed the insert character near the end of lines 149 and 169. However, the most likely cause of your problem are the characters in lines 120 and 121. To obtain these characters press the Commodore key together with the @ key.

In Hints and Tips, we regularly publish a section explaining the cursor characters and this may help you with some of the other programs.

Dear Sir
I would like to ask you a few questions.

Is there a program enabling the 64 to be connected to a Texas Ti99/4a? If not could you publish one? Is there a Commodore user club for the 64 in Belgium?

D. Geest,
Ostend,
Belgium.

We have never published a program connecting the 64 to a Texas Ti99/4a. The two machines are very different and transferring programmes would involve a lot of time and effort. Data routines, for example would be extremely awkward as both machines use different processes and speed routines. Because the results of such a connection are likely to be disappointing we have no plans to publish such a program.

We haven't heard of any Commodore User Clubs in Belgium, but if any readers know of one, we will forward relevant information to Mr Geest. Meanwhile, perhaps you could start one yourself!

Dear Sir
I am having a problem with my 64. I changed the numbers POKEd into the locations for several keys. When I press 'Z C B M . shift (right) space and F1' nothing happens on screen. The cursor doesn't move, the shift on the left side works but the aforementioned keys don't work in the shift mode either.

Could you please send me the memory locations and appropriate numbers to POKE into those locations. If you think my problem is due to anything else, I would appreciate advice.

Jenny Schaeff,
Quebec,
Canada.

It sounds like your machine is faulty – as soon as your machine is switched off the effect of all POKEs are undone. Memory locations and POKE numbers will have no effect. We suggest you take your machine back to the suppliers.

Dear Sir
I have a VIC-20 and will soon be expanding it to 64K. Is there any way of turning it into a Commodore 64? Can I use 64 programs on it?

David McAllister,
Nailsea,
Avon.

The answer to both these questions is 'no'! The VIC-20 is a completely different machine to the 64 and it will not run with any 64 programs even with a 64K memory.

Dear Sir
I became interested in Modems after reading a survey you did in Vol 2 No 11 and subsequently bought one for my VIC 20.

Unfortunately, I am finding it extremely difficult to find the numbers for databases and at present only have three numbers. Is there a book with all the Database numbers in or perhaps some other source of information?

David Rigby,
St Helens,
Merseyside.

There are several sources of telephone numbers for databases, bulletin boards or teletext systems, but as far as we know, no comprehensive list of numbers has been published. If any reader knows of one, please let us know.

Computer clubs and user groups will be the best source of numbers. Many of these clubs have set up their own networks and will have advice for anyone not fully familiar with their modem. Computer magazines are also a good source of numbers and Commodore Computing are planning a feature on the Communication Networks in the near future.

If you can make it to either London or Leeds, the two locations of the Fifth International Commodore Computing Show (see our show guide in this issue) live demonstrations of Compunet, an electronic shopping service will be featured. VIC 20 owners will probably be able to get advice on adapting their own machine.

THE ADDRESS TO WRITE TO IS:
QUERIES, Commodore Computing International,
167-169 Great Portland Street, London W1.
THE TELEPHONE NUMBER TO CALL IS:
01-636 6531 (remember – Thursday afternoons, 2 pm till 5 pm)

TELEPHONE ENQUIRIES
If you are really desparate for an answer and feel you really cannot wait for a published reply you can use our telephone enquiry service. We will have two of our staff standing-by every Thursday afternoon between 2 pm and 5 pm. That's when we want to hear from you.

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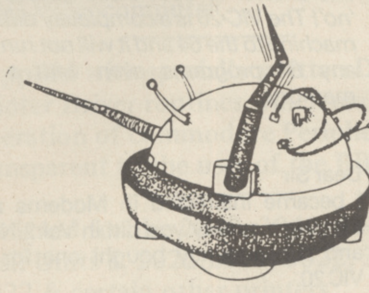

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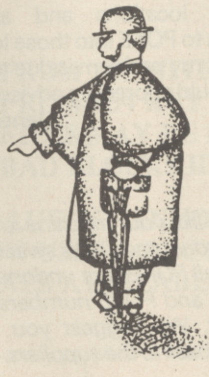

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Courses are available from: W.H. Smiths, BOOTS, SPECTRUM stores and all good computer shops and many bookshops.

New arrivals

This month's look at recently-released products for Commodore machines includes a payslip, a painting program and a Basic Stretcher

KOALAPAINTER

In recent months, a wealth of colour graphics programmes and various gadgets such as lightpens have been produced to help the most ungifted artist produce some sort of masterpiece. The arrival of the Koalapad and its accompanying program, at £79.95, puts them all to shame.

The pad itself is about A5 size, light, slim, easily transportable and attaches to the 64 via user port 1. It is accompanied by a plastic stylus pen and an extremely good graphics program. The packaging claims great things, but before it can be used to create a custom keyboard or used as a joystick the correct software is needed and unfortunately there is none available in the U.K. (However, you can write your own program or use the one provided in Commodore's Programmers Reference Guide.)

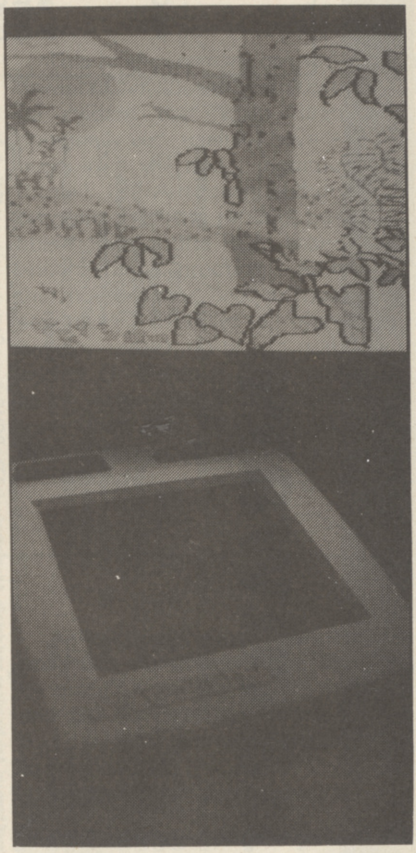
Operating the Koalapad is childishly simple and the manual is well written, leaving nothing unclear. It should be noted that a 1541 disk drive is needed for the disk version and even with the cartridge, a disk and disk drive will be needed to store your own pictures.

The menu is divided into commands, brushes and a colour palette. It is obvious that a lot of care and thought has gone into making this program comprehensive and a lot of fun. The pad has two buttons which control program operation and a touch pad which is extremely stable and very accurate to use. Drawing straight lines in freehand style results in a fairly straight line, the image is stable on screen and colours don't 'run' when over lapping. Details like these make Koalapainter superior to many of the lightpens. Best results are obtained using a sharp object like the stylus on the touchpad.

The colour palette contains 16 colours, 16 patterns and there are eight different brushes to choose from. Besides the usual commands like 'circle', 'lines' and 'fill' there is a 'mirror command' enabling you to create three mirror-like images of anything you draw, an 'oops' function which erases the last thing that was done and a 'Zoom' command. This enables you to add detail to any drawing by enlarging any part of it.

Perhaps the best way of viewing its versatility is to look at the pictures already stored in the program. Using the 'get', 'swap' and storage commands, the user can call up two screens for immediate use. For instance with the farm and the farm animals screens, the animals can be taken from the latter and reproduced on the empty farm scene. Similarly with the castle scene, pictures of dragons and knights in armour can be taken from the second viewing screen and used to complete the castle illustration. Very few graphic programs include this two screen facility.

Audiogenic are aiming the Koalapad at the consumer market, but it is so accurate and versatile that it could be used in numerous business and professional applications where colour graphic images are needed. Koalapainter is by no means cheap, but the graphics program is one of the best on the market and would make a great addition to anyone's computer gadget collection, whether for pleasure or business.



Product Name:
Koalapainter
Product:
Koalapad touch tablet, stylus and paintbox program
(Cartridge or disk)
Company:
Audiogenic Ltd, P.O. Box 88, Reading, Berks. Tel: 0734 664646
Koalapad Features:
Size: 20cm x 16cm x 2cm
Cream body with two black buttons and touchpad
Cable plugs into port 1 of 64
Program Features:
Commands – draw, frame, circle, change colour, mirror, line, box, disc, copy, swap, lines, rays, fill, zoom, storage, erase and oops (error correction)
8 brush sets
16 colours and 16 patterns
Two separate viewing screens
Saving facilities
System Requirements:
64, Commodore 1541 disk drive and colour television or monitor
Applications:
Creative and educational use
Documentation:
Clear, well written manual describing Koalapainter program and a manual with advice on caring for the Koalpad
Price:
£89.95 with cartridge
£79.95 with disk

64

hardware

Product	OUR PRICE
(a) Commodore 64	£195
(b) 1530 cassette unit	£ 45
(c) 1541 disk unit	£199
(d) SX64 + £250 software	£850
(e) MPS801 printer	£199
(f) 1526 printer	£310
(g) Epson FX80	£400
(h) Epson RX80	£275
(i) 1701 monitor	£210
(j) parallel interface to link 64 to (g)	£ 25
(k) interface to convert any cassette recorder to 64/Vic20 use	£15
(n) package (a) + (b)	£230
(o) package (a) + (c)	£387
(p) package (a) + (c) + (e) +Easy Script, Easy File and Intro to Basic (all on disk)	£620

(Offers subject to Commodore supply)

Prices include VAT. Carriage is free except on credit orders. A full range of hardware and software is available by mail from us. Ask for prices and details. Alternatively, visit The DGH Software Centre's new shop at 10 North Street, Ashford, opening end of May. A full range of books also available by mail order at normal retail price plus £1 p&p.

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If answering machine is in use be prepared to state program name, your credit card number and expiry date, your address and telephone number.

software selection

This is a selection of some of the best programs for the Commodore 64 from a list of over 900 we can supply, covering the products of 100+ software houses from the UK, rest of Europe and the USA. A 20-page listing and later updates are available free to customers (otherwise 50p and large SAE. Add 50p p&p for orders under £20. (Europe £1 on each item of software).

NEW PRODUCTS

CP/M (rd60) gives you the benefits of the Z80 processor and a full operating system. **PILOT** (d65) is an outstanding tool and authoring language for creating educational programs with care – ideal for teachers. **LOGO** (d39) and **PASCAL** (d49.95, 14.95) also now available. If you're a pinball freak then **PINBALL CONSTRUCTION SET** (d29.50) or **NIGHT MISSION PINBALL** (dc21.50) will really flip your mind! Absolutely outstanding. **SOLO FLIGHT** (dc25), **HELLCAT RACE** (dc25) and other flight games/simulations now in stock! **MAGIC DESK** (r47.50) is a superb icon-driven filing and office aid. Type letters, record names, inventories – anything you want to type and file! Finally **DISCO** (9.95) – the best of all the tape-disk transfer utilities!

WORD PROCESSING

PAPERCLIP (d90) is the most sophisticated and versatile wp program for the 64. Very good too is **VIZAWRITE** (r78 d65) which also has a spell-check program **VIZASPELL** (d20 if bought with VIZAWRITE, else d65). But for casual wordprocessing of extreme sophistication we recommend **HOMEWORD** (d35) which is outstanding value and very easy to master. It uses 'icons' to symbolize menu options (as used by Lisa). Contains several really innovative features. Much further down the scale but ideal as a low cost text editor is **WORD WIZARD** (5.99). Compatible labelling programs are available.

UTILITIES

DISKEY (d36) is a really powerful disk editor which enables you to manipulate fully your 1541 and files produced on it. **PROGRAMMER'S UTILITIES** (d14.99) surely represents the best value if you have a disk: sprite, character, and sound editors are provided in addition to a PET emulator, and disk copy utilities – a dozen in all!

COMPACTOR (d10.50 8.50) cuts out all wasteful programming including REMs and spaces. This can speed up programs and salvage memory. Various good quality sprite and character editors are available including **SUPERFONT 4.0** (6.75) **SPRITE/GRAPHICS EDITOR** (5.99) **SPRITEMAKER 64** (6.75). On the music side there's **MUSIC COMPOSER** (r9.99) **ULTISYNTH** (14.95) and **SYNTHESOUND** (r25 d25). If you have a lot of tape-based software, **DISCO** (c9.95) can be used to transfer much of it to disk – this is a truly powerful utility which is the best of its type. **KOALAPAD** (75) is an outstanding hardware accessory which enables you or your children to create wonderful screen pictures which can be saved and displayed independently. Complete and ready to go. Other 'pad' software also available including LOGO.

PROGRAMMING AIDS

These range from improvements to C64 BASIC to actual programming aids. **SIMONS BASIC** (r50) adds 114 extra commands and facilities, and the rather better planned program **BC BASIC** (r50 17.95) does much the same. Best of the compilers and excellent value is **PETSPEED** (d50). On the machine code front there are numerous monitors and assemblers the best of which is **MIKRO ASSEMBLER** (r53) but **MONITOR** (r29.95) **ASSEMBLER DEVELOPMENT** (d24.95) **HESMON 64** (r29) **MASTERCODE ASSEMBLER** (14.95) can all be recommended. If you want to learn about machine code programming we suggest **ASSEMBLER TUTOR** (d29.95 29.95) or Honeyfold's **BEGINNER'S ASSEMBLY LANGUAGE PROGRAMMING** (14.95). If you plan writing your own database programs highly recommended are **CODEWRITER** (d85) and **THE LAST ONE** (d97) which both produce stand-alone code. **MASTER 64** (d69) is an outstanding suite of program development aids.

DATAFILES/DATABASES

Unquestionably the one program to have if you can afford it is **SUPERBASE 64** (d88) which we have on special offer by way of encouragement! This is a sophisticated programmable relational database. Think of what you would like your database program to do – and SUPERBASE will probably be able to do it! Very, very powerful and very, very versatile. **INFODISK** (d73) and **DELPHI'S ORACLE** (d90) are very similar and offer larger individual records but more restricted programming constraints. Multifunction database/wordprocessors include the excellent **MAGPIE** 64 (r95) **INFOMAST** (d90) and **VIZASTAR** (d99). All these programs are capable of serious disk-orientated business applications. **DIARY 64** (r30) is a really excellent 'single page' datafile for tape or disk records. For tape users we recommend **INFOTAPE** (16.50).

FINANCE & BUSINESS

MULTIPLAN 64. The outstanding spreadsheet for the 64 – special offer version d75 (normally d95). **CALCRESULT** (d95) is another very sophisticated but 3D spreadsheet we highly recommend for serious business uses. **PRACTICALC** (d40 35) is very good value. Also: **FUTURE FINANCE** (d75) and **BUSICALC 2** (d79 77). For home accounts there's **HOUSEHOLD FINANCE** (21) **MONEY MANAGER** (9.99) the very sophisticated **HOME ACCOUNTANT** (d52.50) **TIME & MONEY MANAGER** (d49). Business account programs are available also. For a low cost example **BUSCOM-1, BUSCOM-2, BUSCOM-3** and **BUSCOM-4** are for monthly accounts, wages, retail accounts, and stock system respectively (all d21 19 – demonstration versions at d4.50 2.50 each). Expensive and sophisticated alternatives are also available. For VAT record-keeping and a full audit trail we unreservedly recommend **MICRO SIMPLEX 64** (d175). A very professional program with full product support. Suits Schemes A to F. Demo available.

RECREATIONAL

We can supply any of the popular games from established software houses and this includes an unbeatable selection of imported material. If there's a program for the 64 … we can usually provide it! Look out for **ALICE IN VIDEOLAND** (d27) and the definitive C64 **FLIGHT SIMULATOR II** (d35). Really good imports include **BLUE MAX** (d29 29) which has truly outstanding graphics and diagonal scrolling like **ZAXXON** (d29 29) which is at last available. There's also **PROTECTOR II** (d25 25) **FORT APOCALYPSE** (d23 23) **PITSTOP** (r27.50) **JUMPMAN** (d27.50 27.50) and **JUMPMAN JUNIOR** (r27.50) … but there are many others! Interested in adventuring? Highly recommended are the following: **COLOSSAL ADVENTURE, ADVENTURE QUEST, DUNGEON ADVENTURE, SNOWBALL, TIME LORDS** and **TWIN KINGDOM VALLEY** (all 9.50 each) **THE HOBBIT** (14.50), plus Infocom's **ZORK I/II/III, STARCROSS** (all d29 each) **WITNESS, DEADLINE, SUSPENDED, ENCHANTER, INFIDEL, PLANETFALL** (all d36 each). A good range of Commodore cartridge software is now available – best of these is **INTERNATIONAL SOCCER** (r9.99). All the new games also available: **MAZIACS** (6.95), **VALHALLA** (14.95), etc. **64 DOCTOR** is a useful diagnostic program to sort out your hardware problems. Choose from two really great chess programs: **COLOSSUS CHESS** (9.95 – Outstanding value) and **GRAND MASTER** (17.95).

Please note that the prefix (d) before a price denotes that the program is available on disk (for example d25). The prefix (r) (as in r29) indicates that the program is in cartridge form and costs £29.00. Tape program prices have no prefix. Our list includes details of EDUCATIONAL, ACCOUNTING, BUSINESS and GAMES programs not possible to itemize here. PLEASE TRY US IF YOU ARE HAVING DIFFICULTY LOCATING A PROGRAM. Please make cheques/PO's payable to the Six-Four Supplies Company.

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BASIC STRETCHER

Basic Stretcher is a recently released 8K machine code program for BASIC 4 PET/CBM computers, which is loaded from tape or disk. It gives BASIC about 38 extra commands including all those of Microsoft's "BASIC-80 release 5" (Commodore machines are based on release 4). It is available from Supersoft for £25, but is it value for money? David Hornsby finds out!

First a little on the product's presentation. It is supplied on tape (although it may be re-saved on disk for subsequent use) and comes with a 45 page manual describing all the commands in alphabetical order. This is fine for reference but not the best way for learning Basic Stretcher. For each command there is an example of its use and some comments where appropriate. I found one or two inconsistencies in the text but managed to figure out what was meant in each case. The purpose of most commands is fairly obvious but some puzzled me for a while and I would have appreciated more explanation of the CASE and DEFINT statements for example.

The added commands are of two types:

1) commands and statements: typically TOOLKIT like commands but more powerful and many more of them.
2) functions: mostly trig and string functions.

Many of these I have seen in other products but some are new to me. RENUMBER for example will renumber part of a program only if required. IF . . THEN . . ELSE is provided. SIZE prints five figures; namely program, variable, array, string and free memory usage. ERASE, EXPAND and CONTRACT are array commands. CHAIN, MERGE (a true merge from disk) and RUN operate on whole programs. CASE, ENDC and LABEL add a programming structure similar to that of PASCAL. VARPTR gives the memory address where a variable is stored, useful for passing data to a machine code subroutine. All the missing trig functions are provided and all trig functions may be in degrees or radians. INSTRING, STRING$ and MID$ are neat extra string commands.

Commands I have met before include number base conversions, quarter block line plotting, screen and program to printer listing, PACK to shorten a program, UPPER, LOWER, REPEAT and CURSOR control.

There are still more commands as yet unmentioned: AUTO for line numbers, BYE to exit Basic Stretcher, COLOUR used in plotting, DEBUG to enter the machine code monitor, DELETE lines, DUMP variables, FIND, HELP, RESTORE to a line number, FIX to round numbers to the nearest integer, and SWAP two variables. I was disappointed by the absence of one or two features (eg. print using, scroll, sort) but delighted by the thoughtfulness of others (eg. the way Basic Stretcher may be loaded automatically together with a program).

This brief summary can only give a flavour of this powerful product but it will be evident that Basic Stretcher is potentially very useful. I have found no bugs in it yet and congratulate Neil Russell, the Australian author on his program. Had the product been available before all the ROM based BASIC enhancement products came along then it would have been a "must" for all serious PET users. In the event it may have appeared too late to make much impact. On the other hand it may prove to be yet another product to demonstrate that the PET/CBM computer, despite its age, is still very much alive and kicking.

PAYSLIP

Pitman's Payslip is designed to familiarise business users with the intricacies of payroll programs.

Payrolls are often complicated by the varying requirements of a comany, but Payslip only deals with the basic principles involved in wage payments. Documentation accompanying the program caters for both students and teachers and is written so that the instructions are extremely easy to follow. Validation Routines make it very easy for anyone to correct mistakes. Notes for teachers give advice on additional exercises, for example completing a P11. In fact it is extremely easy for a teacher to make back-up copies and check any mistakes made by the students. Payslip is only intended to provide a back-up to classroom teaching and by following the assignments in the manual anyone using the program will soon be familiar with the idea of using payroll programs on computers.

Payslip assumes that everyone is paid by the hour with overtime payments. Included in the program are the calculations for the official Pay Tables, Taxable Pay Tables and the National Insurance Contribution Tables (these variables can be altered). The four assignments are accompanied by tables listing necessary information.

The main menu covers instructions on operating Payslip, creating employee files, calculating employees wages, wage bill and coin analysis and Pay records. There is no difficulty changing from one function to another and everything can be printed out. With Payslip, the weekly wage can be calculated and printed out in the form of a payslip and the index of employees and numbers or individual pay records can be shown. An employee's pay record shows the works number; tax code; national insurance code and number; basic and overtime rate by the hour; gross pay and tax paid to date; national insurance contributions and gross and net pay in a week.

Although many intricacies of payroll programs are not included, Payslip will be useful in helping people unfamiliar with the computer to put any information they have learned in the classroom to practical use.

Product Name:
Payslip
Product:
Program demonstrating principles involved in Payrolls
Company:
Pitman Publishing Ltd., 128 Longacre, London WC2E 9AN. Tel: 01-379 7383
Hardware Requirements:
Pet 8000 series, disk drive and printer
Applications:
Educational aid designed to help students with payroll programs
Documentation:
Informative, easily understandable with example assignments for both teachers and students
Price:
£39.50+VAT

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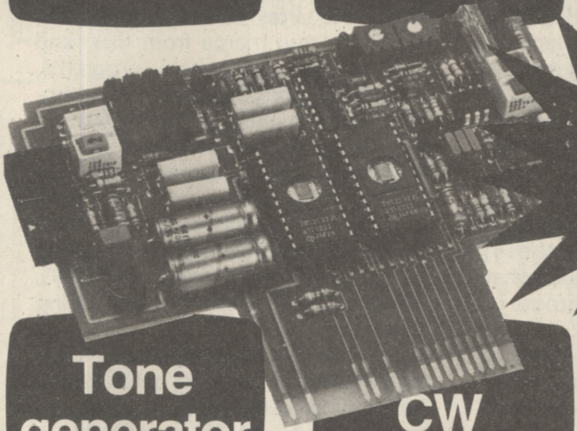

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Plug in the interface, switch on your Commodore and the system is in operation! Over sixty commands are recognised by the COM-IN 64 program to ensure maximum operation convenience.

Major features of the COM-IN 64 program:

- Written in fast and efficient 6502 machine language.
- Baudrates 45, 50, 75, 110 and 300, each adjustable with fine tuning system.
- Maximum Baudrate approx. 1500 in word processing mode.
- Morse speed 5 to 99 words per minute.
- Split screen. Compose and edit text while receiving.
- 12 K byte text buffer in memory.
- Three active cursors. Receive, transmit and keyboard.
- Store received and transmitted messages on diskette.
- Disk-based mailbox system.
- User definable WRU.
- Create brag tapes on disk or cassette files.
- Transmit disk or cassette files.
- Hard copy available with a printer.
- Automatic word-wrapped carriage return and line feed. On transmit selectable.
- Unshift on space selectable.
- Seven 80 character message buffers with display, print and write options.
- Load and save message buffers on tape or disk.
- Software controlled CW sidetone, ASCII and BAUDOT AFSK.
- 14 tones selectable for adjustment purposes. (4 for modern adjusting).
- Sync idle, slow mode and word by word mode.
- Auto transmit/receive switch for telephone line.
- Replay received message with resend command.
- Four CW identification options.
- CW FSK identification for RTTY.
- RYRY generator (baudot RTTY test signal).
- Quick brown fox generator.
- Several callsign generators available.
- Received text word-wrapped at end of screen lines.
- Keyboard selectable normal/reverse tones for all modes except for CW transmit mode.
- Direct mode for fast break-in operations.
- 24 hour real time clock displayed on status line. (CIA TOD clock with automatic 50/60 cps selection).
- Send current time with QTR command.
- Random mode sends 5 character groups for morse practice.
- Loop mode for printer adjustments or beacon-like operation.
- Keyer mode allows connection of manual Morse paddle.
- Unique large TIMES SQUARE character display option.
- Ignore carriage return on receive option.
- User definable switch facility.
- Page mode allows reception of RTTY pictures etc.
- Byte mode allows transmitting program files.
- Modem mode with automatic Bell/CCITT selection.

Further details:

ComputerWorld's COM-IN 64 program is supplied with self supported power supply, cables and connectors. In the extensive 70 page user manual you'll find the complete schematic and 2 program listings for QHT locator and LOGBOOK.

How to order:

Send a postcheque or your MasterCard/VISA credit card number (with expiration date!), your name and full address to:
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HINTS AND TIPS

Machine Code to Basic

In this article we are going to explain how to command the computer to run a Basic program from machine code.

This can be done in two different ways: the first is to use the keyboard buffer and the second is to use the ROM routines inside the computer. We will explain how to do this for each of the different machines.

Method 1: Keyboard Buffer

This is very simple, all that is required is to set the characters 'RUN' followed by a return into the keyboard buffer. It would be wise to clear the screen first as well.

```
CBM 64: JSR $E544       ; Clear screen
        LDA #$52        ; Character 'R'
        STA $0277       ; Keyboard Buffer
        LDA #$55        ; character 'U'
        STA $0278       ; Second location
        LDA #$4E        ; Character 'N'
        STA $0279       ; Third location
        LDA #$0D        ; RETURN
        STA $0280       ; Fourth location
        LDA #$04        ; Number of Chars
        STA $C6         ; in Buffer
        JMP ($0302)     ; Basic Warm Start

VIC 20: LDA #$93        ; CLR character
        JSR $FFD2       ; Print it
```

Then as for the 64 after the first command.

```
PET B4: JSR $E051       ; Clear screen (80 col for 40 col:
                        $E04B)
        LDA #$52        ; Char 'R'
        STA $026F       ; Keyboard buffer
        LDA #$55        ; Char 'U'
        STA $0270       ; 2nd loc
        LDA #$4E        ; Char 'N'
        STA $0271       ; 3rd loc
        LDA #$0D        ; RETURN
        STA $0272       ; 4th loc
        LDA #$04        ; No of Chars
        STA $9E         ; in buffer
        JMP $B3FF       ; READY.

PET B2: JSR $E229       ; Clear screen
```

As for PET B4 after first command until last but one.

```
        JMP $C389       ; READY.
```

Method 2: Direct Call

In this method, the ROM routines are called to produce the run. In this method, only three commands are required to produce a run and there is no need to clear the screen.

```
CBM 64: JSR $A65E       ; CLR
        JSR $A68E       ; Backup text pointer
        JMP $A7AE       ; Cause RUN

VIC 20: JSR $C65E       ; CLR
        JSR $C68E       ; Backup T.P.
        JMP $C7AE       ; Cause RUN

PET B4: JSR $B5EE       ; CLR
        JSR $B622       ; Backup T.P.
        JMP $B74A       ; Cause RUN

PET B2: JSR $C577       ; CLR
        JSR $C5A7       ; Backup T.P.
        JMP $C6C4       ; Cause RUN
```

User Defined Character Plotting

Here we have a short Basic program that allows you to plot onto a user-defined character area on the 64 by entering the co-ordinates and either plot or unplot.

This program is useful for creating characters that are larger than 1 character position and when finished plotting, the character data will be displayed onto the screen in the form of line number, DATA, and values. These can then be used by typing new and pressing return on the lines.

```
10 REM PROGRAM FOR PLOTTING POINTS ON
20 REM USER DEFINED CHARACTERS.
30 REM
40 REM COPY CHARACTER ROM INTO RAM
50 POKE56334,PEEK(56334)AND254
60 POKE1,PEEK(1)AND251
70 FORI=0TO1023
80 POKE12288+I,PEEK(53248+I):NEXT
90 POKE1,PEEK(1)OR4:POKE56334,PEEK(56334)OR1
100 POKE53272,(PEEK(53272)AND240)OR12
110 POKE56,48:POKE52,48
120 REM SET REVERSED CHARACTERS TO 255
130 FORI=1024TO2037:POKE12288+I,255:NEXT
140 REM INPUT SIZE OF AREA
150 INPUT"⅃▪ENTER DIMENSIONS (X,Y)";X,Y
160 IFX=0ORY=0ORX*Y>128THEN150
170 BASE=13312:PRINT"⅃":GOSUB500
180 FORI=0TOY-1:FORJ=0TOX-1
190 POKE1065+J+I*40,128+J+I*X
200 POKE55337+J+I*40,1
210 NEXT:NEXT
220 CD$=LEFT$("⌂◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙",Y+2)
230 PRINT"⌂▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶MAX X="X*8-1
240 PRINT"▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶MAX Y="Y*8-1
250 PRINTCD$
260 REM INPUT CO-ORDINATE FOR PLOT
270 INPUT"ENTER COORDINATE X=-1 TO END";X1,Y1
280 PRINTCD$:GOSUB570
290 IFX1>X*8-1ORY1>Y*8-1THEN250
300 IFX1=-1THEN1000
310 IFX1<0ORY1<0THEN250
320 REM INPUT WHETHER PLOT OR DELETE
330 PRINTCD$:INPUT"PLOT OR DELETE";A$
340 PRINTCD$:GOSUB570
350 IFA$<>"P"ANDA$<>"D"THEN330
360 IFA$="D"THEN410
370 GOSUB460
380 REM PLOT POINT
390 POKEBYTE,PEEK(BYTE)AND(255-2↑BIT)
400 GOTO250
410 GOSUB460
420 REM UNPLOT POINT
430 POKEBYTE,PEEK(BYTE)OR2↑BIT
440 GOTO250
450 REM CALCULATE MEM LOC TO CHANGE
460 BYTE=BASE+INT(Y1/8)*X*8+INT(X1/8)*8+(Y1AND7)
470 BIT=7-(X1AND7):RETURN
490 REM DISPLAY BORDER AROUND AREA
500 PRINT"⌂";:GOSUB610
```

```
510 FORI=1TOY
520 PRINT"▒";TAB(X+1);"▒"
530 NEXT
540 GOSUB610
550 RETURN
560 REM BLANK INPUT LINE
570 FORI=1TO60
580 PRINT" ";:NEXT
590 PRINT:RETURN
600 REM TOP AND BOTTOM LINE OF BORDER
610 FORI=1TOX+2
620 PRINT"▒";:NEXT
630 PRINT:RETURN
1000 FORI=0TOX*Y-1
1010 PRINT60000+I"DATA";
1020 FORJ=0TO6:PRINTMID$(STR$(255-PEEK(BASE+I*8+J)),2)",";
1030 NEXT:PRINTMID$(STR$(255-PEEK(BASE+I*8+7)),2)
1040 NEXT:END
READY.
```

CURSOR CHARACTERS

```
▚ - By pressing the cursor down key
▝ - By pressing the cursor down key with the shift key
▐ - By pressing the cursor right key
▌ - By pressing the cursor right key with the shift key
▞ - By pressing the home key
▝ - By pressing the home key with the shift key
■ - By pressing the control key and key 1
▙ -                                 key 2
▛ -                                 key 3
◣ -                                 key 4
▓ -                                 key 5
▜ -                                 key 6
▀ -                                 key 7
▆ -                                 key 8
▚ - By pressing the CBM key with    key 1
▛ -                                 key 2
▩ -                                 key 3   ■ - By pressing key F1
▜ -                                 key 4   ▟ - By pressing key F2
▞ -                                 key 5   ▬ - By pressing key F3
█ -                                 key 6   ▙ - By pressing key F4
▝ -                                 key 7   ▐ - By pressing key F5
▚ -                                 key 8   ▟ - By pressing key F6
▞ - By pressing the control key and key 9   ▌ - By pressing key F7
▬ -                                 key 0   ■ - By pressing key F8
```

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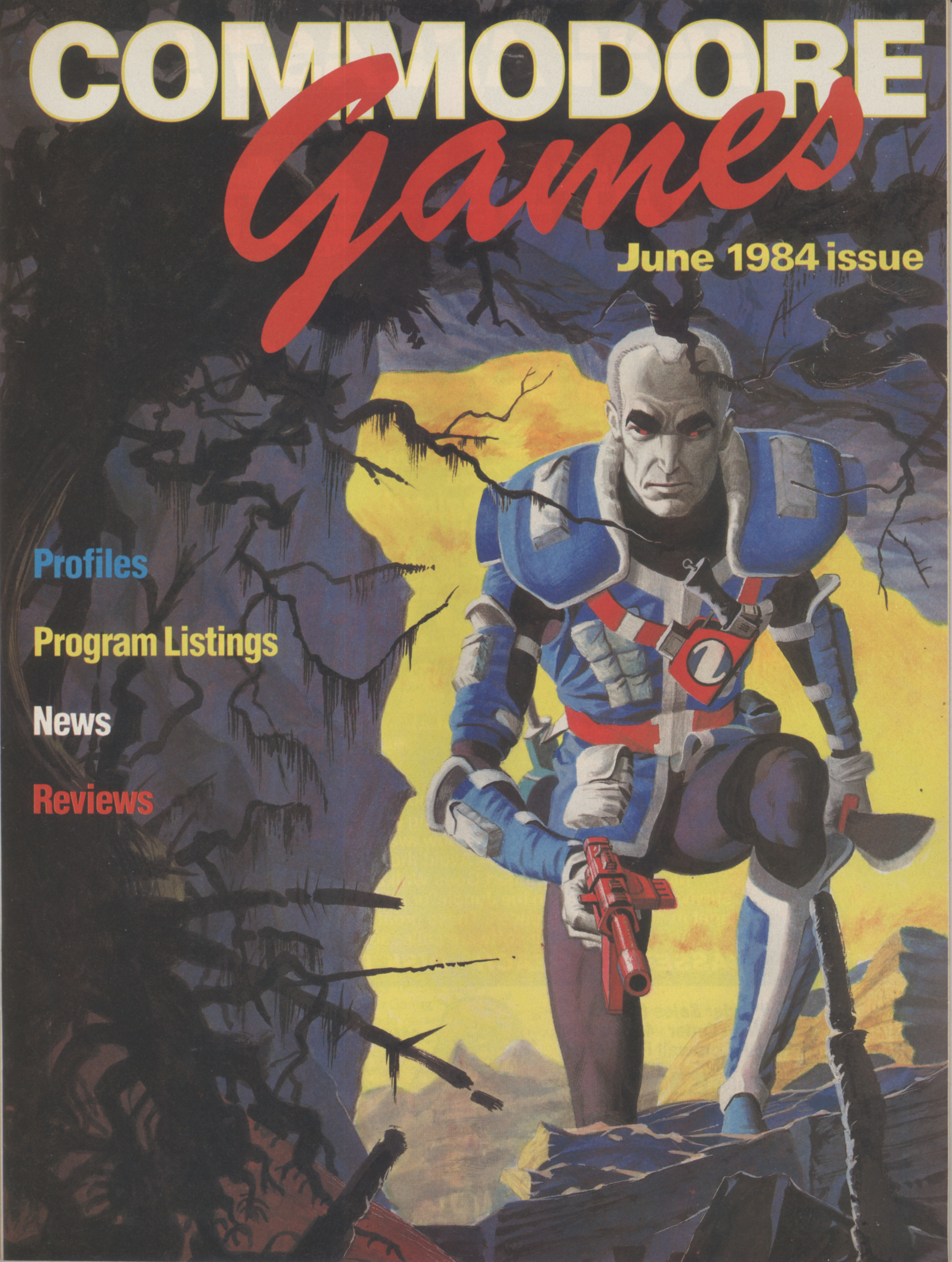
COMMODORE *Games*

June 1984 issue



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News

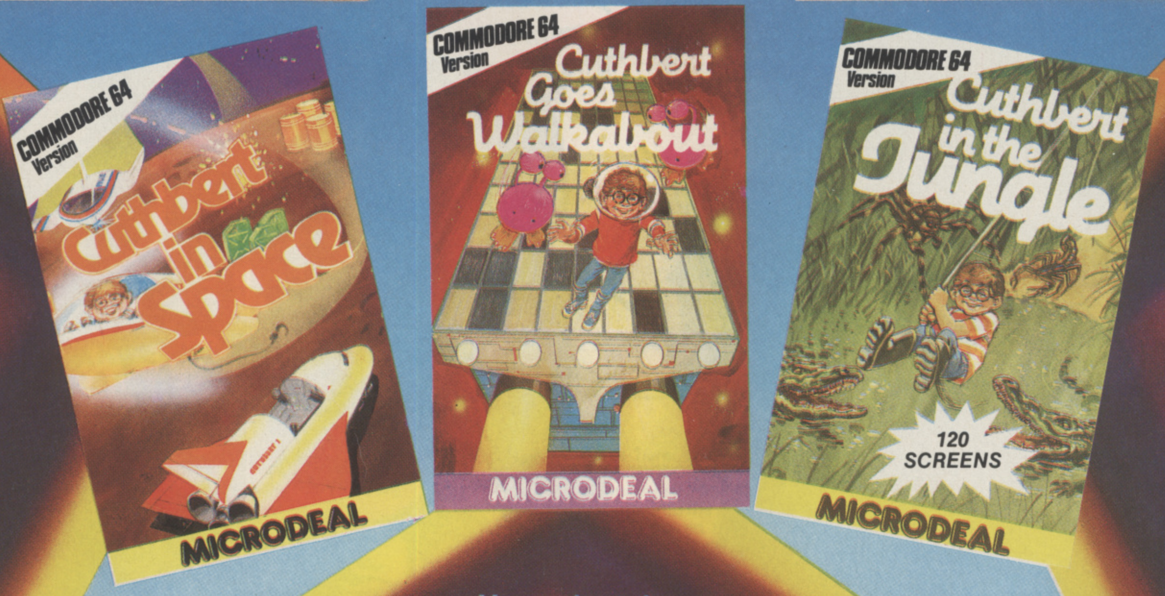
Reviews

NOW AT LAST!

Cuthbert

ON THE

Commodore 64


COMMODORE 64
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Version
Cuthbert in the Jungle
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Games, games and more games

Numerous interesting games were launched at the Personal Computer Games Show in Solihull at the Easter week-end. Over forty software companies were represented and many of the stands had arcade facilities.

A number of attractions had been arranged for the show. Radio One were transmitting their 'Music Marathon live in another part of the building, but many people were surprised to find that entry to the music contest was an extra £6.

Over seven and a half thousand people attended the show and a show organiser said that he was happy about the figures although they were slightly disappointed by the low attendance for the Radio One show.

Other attractions at the show included Droid, a metal robot, a huge air balloon above the building and loads of software competitions sponsored by some of the companies in the show.

Lemmie, lead singer of Motorhead, paid a visit to the Romik stand to play the new game for the 64, Turtle Jump. Ekim, a giant ant, has been trained by pirates to find treasure. In the search, he has to jump over turtles, crocodiles and other solid objects, eat the fruit on the islands for energy and finally take the treasure from the chest. The cassette costs £6.99. Romik also introduced the Multisound Synthesizer. Retailing at £14.99, it can be used as a keyboard or tunes can be created utilising a wide variety of sounds.

The most recent games for the 64 from Interceptor Micros are on cassette or disk costing £7 and £9 respectively. In Aquanaut, order is maintained by a submarine patrol until the Caves of Shallic appears. Armed with sea tanks, missiles and hunting mines the patrol must destroy the Shallic Caves, Lead the patrol to the deepest cavern and return to base to win.

Trapping butterflies and flies is the aim of Spider and the Fly. Encircle an insect and complete a web, but watch out for the dangers. Wallie goes to Rhymeland is all about a hero armed with chewing gum who enters into the world of Little Miss Muffet and Bo Peep. Get the golden ring to be victorious.

Alice in Videoland, the new Audiogenic game seemed to attract attention at the show. The player takes the role of Alice and wanders through screens featuring characters straight out of the book, scoring points and negotiating some tricky situations. Available on disk for £12.99.

Mastertronic, a relatively new company displayed a large variety of games costing just £1.99. The newest releases for the 64 and VIC-20 included Sub Hunt, Squirm and Phantom Attack. A company spokesman told CCI that they had dropped the prices after extensive research into the software market. He emphasized that in no way did the price reflect the games quality.

Jeff Minter clad in Llama T-shirt, Llama jumper and clasping a stuffed felt Llama made his appearance at the show. His new game, Sheep in Space, made its debut and to celebrate they had a large woolly sheep hanging on the stall wall. As with their other games all the action takes place millions of miles away in metagalactic space, but this time you are controlling an interstellar sheep. Available on cassette for the 64, it costs £6.50.

Enigma Software specialise in putting two games on one cassette and two cassettes were released at the show. Insectamania and Planet Zeus on one and Planet Plakton and Planet Zacron on the other. Both are for the VIC-20 and cost £5.50. The other new release was The Game, a fast version of Pacman for the VIC-20 and 64, also £5.50.

Creative Sparks, a new label from Thorn EMI, had their two new games on show: Black Hawk, an action game with a strategic element and Slurpy, a cave creature with a voracious appetite. Both for the 64 on cassette costing £7.75.

Phoenix claim to have introduced a new concept in games – an action/adventure game in a twin cassette pack. By solving the clues in the action game, solving the adventure game is a breeze. The other new release for the 64 is the O'level Caper – be a grade A hero and switch exam papers. Both games retail at £9.99.

Finally Alligata, who you might have seen on Easter Friday's Breakfast Telly, launched five new arcade games retailing at £7.95 for the 64 – Loco, Guardian, Son of Blagger, Eagle Empire and Panic Planet.

There were plenty of interesting competitions, games and other new products to interest the public. There were no catering facilities on the first day, but despite small lapses in organisation, PCG were confident that everything had gone well.

CONTENTS

News 3
Programmers 5
Reviews 11
Programming 21
Listings 23

CCI Master Gamer Contest

Venue: The Commodore Show, Novotel, Hammersmith, London
Date: June 7, 8 and 9.

So you think you're good at playing computer games... here's your chance to prove it.

At the Commodore Show in London Commodore Computing International will be looking for the best games player.

We have selected three of the best games for the Commodore 64 and entrants will be able to play each game for a limited time – or until death! The highest score in each session of two hours will receive a prize and the overall winner each day will receive a bigger prize.

The Commodore Master Gamer will be judged over the three days of the show. The person who has achieved the highest score during those three days will be the Commodore Master Gamer.

Prizes include games from all three software companies – Romik, Anirog and Audiogenic – plus £50 worth of software daily from Commodore themselves.

You should register for the competition as soon as you arrive at the show. The competition will be running for six hours each day of the show and there will be three sessions of two hours. Our time is obviously limited so preference will be given to those who can produce the entry form at the show. We reserve the absolute right to restrict entry.

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The professionals

Continuing our look at programmers

Nalin Sharma – Quicksilva

Nalin Sharma was taking a self-imposed break from programming due to imminent A Levels when we spoke to him. He is the author of Quicksilva's synthesiser, Ultisynth.

Now aged 17, Nalin bought his first computer, a ZX81, three years ago. "We got onto the topic of computers at a friends house," recalls Nalin. "I started reading computer magazines and became more and more interested.

"I used to visit amusement arcades, but the 10p's add up and my pockets were soon empty," he continues. "I thought if I could write one of those games I would be on to a winner."

His ZX81 was soon replaced by a VIC-20 and Nalin taught himself both Basic programming and Machine Code.

Writing games is the sort of programming Nalin enjoys most, but one of his first projects was Ultisynth. He explains: "It was a challenge. I knew that if I could write a synthesiser program I could do anything."

It took Nalin nine months to complete Ultisynth, although half of that time was spent in research – reading books and finding out all about synthesisers.

"I started my research in January '83," says Nalin. "Ultisynth is written in Basic and in Machine Code. I wrote the Basic part in May and then had to break for exams. The Machine Code section took me about four weeks to write and then I went away on holiday."

On his return, Nalin tidied up his program and approached Quicksilva who accepted it immediately. Ultisynth is now selling well, although Nalin was not altogether happy with Quicksilva's decision to market the program at £14.95. He says: "I wanted to price it at around £10 – a price that everybody could afford."

Nalin has no problem in thinking up new ideas for games. "They just click," he says. "I think of something and then try to relate it to a game. Take Jeff Minter, his idea for the game Hovver Bovver came from just looking at a lawn."

Once the idea is there, he puts it all down on paper before committing it to the computer. A method Nalin finds saves time in the long run.

When his exams are out of the way, Nalin hopes to take a year off before going to university – not to study computer science! "What I would really like to do is work full-time for a software company during my year off," says Nalin. "I've got a lot of good ideas for games which I'm sure will be successful."

Mike Wacker is one of America's leading games programmers and has topped the US games charts with titles such as Video Vermin and Annihilator. He also wrote several of the titles which launched Mogul Software earlier this year including Labyrinth of the Creator and Fire Ant.

Mike has been writing games programs for two years now and has had 12 Commodore 64 and VIC-20 games published. Fire Ant is one of his latest games and is reviewed elsewhere in this issue.

"I consider Fire Ant to be my best game so far because it is completely original," says Mike. "Fire Ant deliberately has a lot of variety to it and it isn't just a simple shoot-em-up. It takes brains to play it."

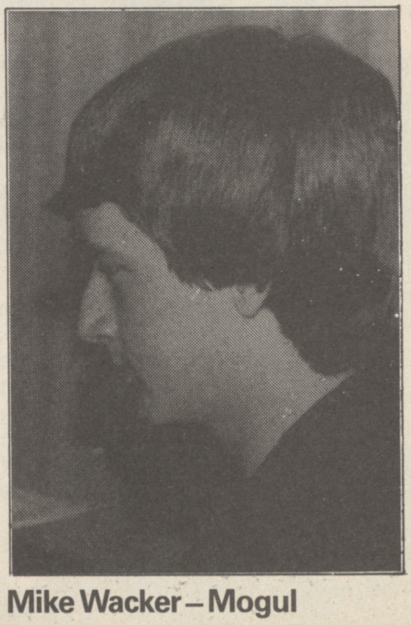
Ideas "fall out of the air" for Mike and once there, he uses a systematic approach to develop the game. Mike explains: "I usually think the whole game through in terms of the storyline and what I want to happen. Then I might code it down on paper first and see if it will work before programming it into the computer. Then it is a case of slugging it out and refining it again and again until I am totally happy with it."

It can take Mike anything up to two months to write a game, although his record time is 11 days (Annihilator). "I always spend a lot of time refining each game," says Mike. "I have re-written some programs five or ten times, but the game gets stronger each time and that is the objective of it all."

Mike believes that there will be a growing trend towards supergraphics – highly detailed pictures – and he usually develops his characters first before adding them to the game at a later stage. He comments: "I usually have the characters all drawn out first to see what they look like and to make sure they fit the theme of the program."

The hardest part of writing a new game for Mike is in thinking up a title, although he doubts whether many people would buy a game on the grounds of the title. He considers a game's playability to be the main selling factor. "Good game play and graphics and lots of variety in terms of having plenty of things to accomplish are the key ingredients. I always put a lot of emphasis on these areas."

Mike, now 20, is currently a student of electrical engineering and has so far resisted the temptation to leave college to become a full-time programmer. He says: "My ambition is to become an electrical engineer. I don't particularly want to go into the software business. I am content just to do the programming and then sit back and watch the money coming in!"



Mike Wacker – Mogul

Terry Watts became involved in computers mainly out of curiosity. He says: "I had no idea what a computer looked like, so I bought a kit – the old UK101."

The benefits of being a self-taught programmer outweigh the disadvantages, according to Terry. "There are a lot of trained programmers around and they tend to do things in the way they were taught," says Terry. "It produces a 'samey' effect, whereas all my work is totally original."

Terry also feels that his age – 42 – works to his advantage. "Kids have a lot of advantages being brought up with computers. I had to fumble my way through, but in the long run it is paying off." Terry continues: "Kids may write a couple of good games, but then the chances are they will discover girls or other attractions, whereas someone like me with a stable family background can keep their mind on programming."

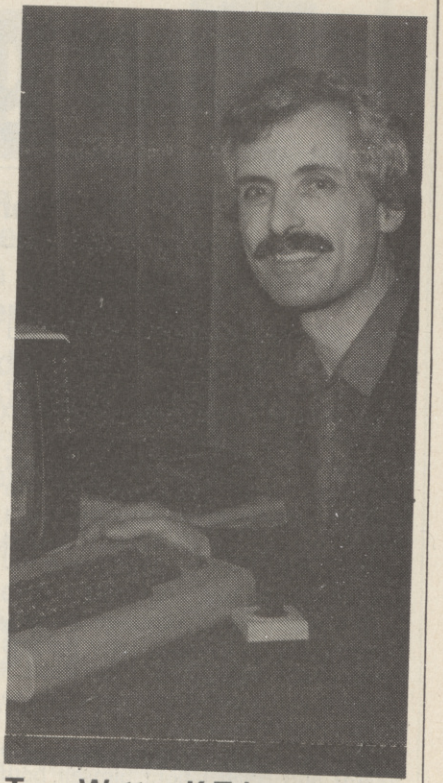
An active two and a half year old son means that daytime programming is impossible for Terry who does most of his work on the computer between midnight and 6 am. He says: "I can't work on the sound of my games at night as my wife says that noises of aliens attacking give her nightmares! So I work on the visual side which is where all my games start. Odyssey (one of Terry's latest K-Tel releases) started when I was just playing around with the computer. I found an effect that looked interesting and took it from there."

Terry explains that ideas come very painfully to him. "I have to dredge them out and then nine out of 10 ideas go straight in the bin, mainly because my wife is very critical," he says. Not that he is complaining. Terry knows that if both he and his wife like a game he is onto a winner.

His association with K-Tel began when the software house asked programmers to submit games. K-Tel accepted 10 games, two of which were Terry's. These were for the VIC, but K-Tel provided Terry with a 64 so he could start programming 64 games for them.

Terry also runs a dancing school so he was the ideal person to program a 64 version of K-Tel's game It's Only Rock and Roll. "I used to play in a rock and roll band," says Terry. "So I knew how the band should look."

He plans to carry on programming until his "brain dries up". "Some people get hooked on playing games," he says. "I'm hooked on writing them."



Terry Watts – K-Tel

Nick Strange is one of Bubble Bus' in-house team of programmers and among the games he has written are Hustler and Kick Off. After university he became a multi-electronic engineer and it was during his first job that he met one of the directors of Bubble Bus. Together they started writing software for Commodore machines.

Much of the thinking behind the games takes place in the pub. Nick says: "We spend a lot of time at the pub discussing games, then each of us goes off and produces a game."

After the initial discussion stage, Nick estimates that each game requires a minimum of two to three months work, coding and then testing the game.

"I like to work out a game in sections," comments Nick. "And I work out everything on paper first – that's the way I have been taught to do it. I do most of my work on the 64 which I like doing as I now know the machine, but I'm looking forward to the emergence of 16-bit machines. The graphics will be better with more memory to use."

Nick enjoys writing and playing games which have no obvious solution, and here he quotes his own game, Hustler. "It is a pool simulation and you can never be quite sure where each ball is going to be hit," he says.

Nick Strange – Bubble Bus

Hustler was written for the 64 and can be played by one or two players. You have the choice of hitting any ball in any pocket, pocketing the balls in a particular order or hitting each ball into the correct pocket.

Working as part of an in-house team, Nick finds himself working a 50 to 60 hour week. He doesn't have a computer at home, but every other weekend he will take one home from the office.

"When I'm at home, my time on the computer is split 50/50 between work and pleasure," says Nick. "I also like to show my girlfriend how each game is progressing. She pulls them to pieces, but it helps to have outside criticism."

Nick and his colleagues at Bubble Bus enjoy playing computer games, unlike many programmers who become sick of the sight of them after spending all day and sometimes all night at the computer. Nick comments: "We play games all the time. There is a lot of crud on the market and people seem to be running out of new ideas for games. The market is changing and things can only get better."

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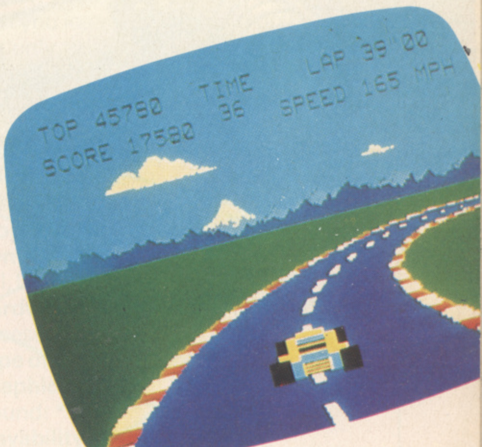
TOP 45780
TIME 36
LAP 39'00
SCORE 17580
SPEED 165 MPH

We're overwhelmed. Though we should just add that with Atarisoft, you can now play Pole Position* on the Commodore 64, BBC and Spectrum computers, as well as on all Atari® systems. Oh, and we're giving away free a Grand Prix kit and full colour wall chart with every game.

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Written by Mike Wacker

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Home Computer Games enter a new age LET — David Cuningham

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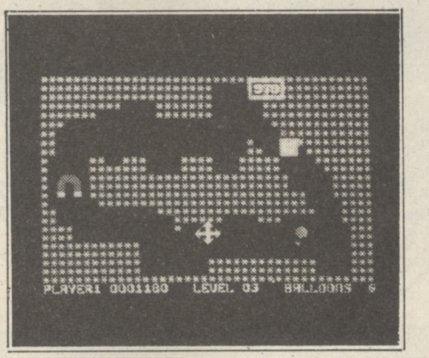
Available for the Commodore 64

Protect and survive

Defuse a bomb, rescue the Queen Ant and discover the life cycle of a frog in this month's selection of recently – released games for the VIC and the 64

CRAZY BALLOON

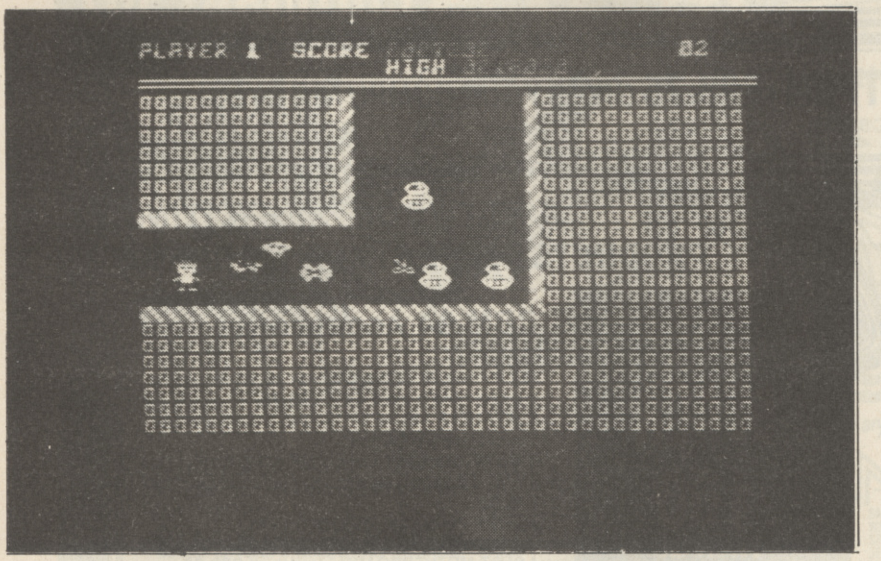
Nathan Wigglesworth – balloonist extraordinaire is on the trip of a lifetime. Can he successfully complete the 26 flight levels and reach the final line? Not without your help he can't.



Each level seems to get more difficult than the last and by the sixth level extreme care and split second timing is needed. Each level is a sort of maze with prickly walls and often resembles a familiar shape, a fish or face for example. If any part of the balloon touches the sides it deflates and sinks to the ground. While making your way around each level, bonus points can be picked up by touching boxes and completing each level. There are some very difficult patches – narrow crevices, magnets exerting a strong pull on the balloon and large prickly objects floating around.

There are five balloons per go and both the current score and the highest score are displayed. The graphics and sound effects are reasonable and Crazy balloon should appeal to those arcade fans who enjoy using their manipulative skills. It is a very tricky game.

Title: Crazy Balloon
Programmer: Chris Lancaster
Company: Software Projects, Bar Brand Complex, Allerton Road, Woolton, Liverpool, Merseyside L25 7SF. Tel: 051 428 7990
Hardware: 64, cassette recorder, joystick optional
Type of Game: Arcade
Graphics: ***
Sound: ***
Playability: ****
Description: Pilot the balloon through 26 flight levels
Price: £7.95
CCI Rating: ***



ZODIAC

All the signs of the Zodiac have been removed from the Time Vaults by evil master adept in the art of Black Magic and scattered about the corridors of time. Your task is to retrieve them and place all 12 in the central chamber.

Besides the demons Jessor, Jukul and Jufo zealously guarding each sign, destructive forcefields also flow along corridor and contact results in immediate annihilation. You wander along the corridors looking for the 12 signs, shooting the demon guards by moving towards them and firing. Once a certain number of points are achieved, the cubit gate opens and the demons multiply. Each level gets increasingly difficult and you have to be extremely quick to shoot them all before they touch you. The controls are fairly smooth and there are some interesting sound and graphical effects.

Once all the signs are collected you are transported to the entrance of the Time Vaults, all the signs disappear and reappear floating around the vaults. Great care is needed to retrieve the signs because the almost indestructible Jemon is on guard. Once you have the sign you lose your shooting powers and the only way to regain them is to drop the sign in the chamber.

Zodiac requires a lot of practise and some luck to play properly and should keep a shoot 'em up arcade fan occupied for a few hours.

Title: Zodiac
Programmer: Jef Gamon
Company: Anirog Software, 29 West Hill, Dartford, Kent. Tel: 0322 92518
Hardware: 64, cassette recorder joystick necessary
Type of game: Arcade
Graphics: ****
Sound: ***
Playability: ****
Description: Gather signs of Zodiac by fighting off demons and travelling through corridors
Price: £7.95
CCI Rating: ****

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"To sum up, **Adventure Quest** is a wonderful program, fast, exciting and challenging. If you like adventures then this one is for you" *– NILUG issue 1.3*

"**Dungeon Adventure** is recommended. With more than 200 locations, 700 messages and 100 objects it will tease and delight!" *– Educational Computing, Nov 83*

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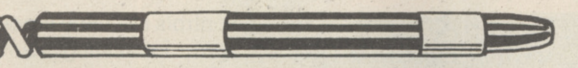
"**Lords of Time.** This program, writen by newcomer Sue Gazzard, joins my favourite series and is an extremely good addition to Level 9's consistently good catalogue . . As we have come to expect from Level 9, the program is executed with wonderful style – none of those boring "You can't do that" messages! Highly recommended." *– PCW, 1st Feb 84*



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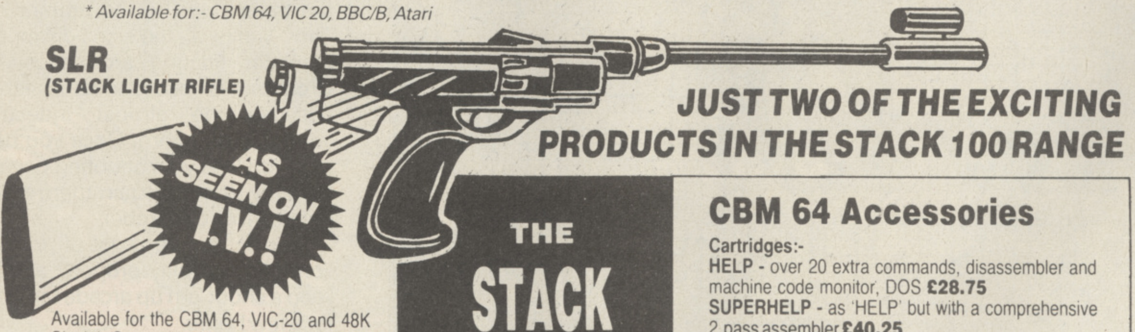
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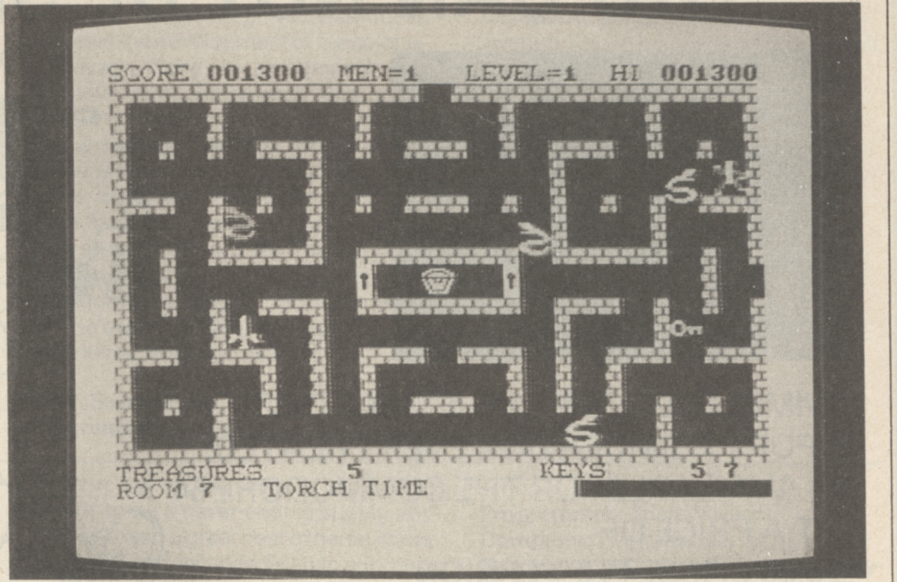

Fabulous treasure has been distributed around nine maze-like rooms and you, the intrepid bounty hunting explorer, must gather it while eliminating and avoiding pursuing snakes, bats, spiders and mummies with fireballs.

The rooms are arranged in a three by three square and are distinguished by their different border colours. Compartments containing the nine different treasures lie in the middle of each room and can only be opened with the right coloured key – an orange key for instance will be needed to open the orange room. These keys are randomly distributed round the rooms and have to be located.

The hunt is made all the more thrilling by nasty little creepies mentioned above who occupy two each of the eight levels you have to get through. Each treasure has a different quality, the white sword gives you an extended time to kill pursuers and the orange lantern gives you unlimited light which tops up the torch graph. If this is allowed to reach 0, the pursuers turn grey. Points are picked up for gaining levels, collecting treasure and killing pursuers.

There are a lot of little extras in this game, some great little tunes and both arcade and adventure fans would find something to interest them.

Title: Krystals of Zong
Company: P.S.S, 452 Stoney Stanton Road, Coventry CV6 5DG
Tel: 0203 81346
Hardware: 64, cassette recorder, joystick necessary

Type of game: Arcade/adventure
Graphics: ***
Sound: ****
Playability: ****
Description: Gather treasure from nine rooms while fighting off pursuing snakes, bats, spiders and mummies
Price: £7.95
CCI Rating: ****

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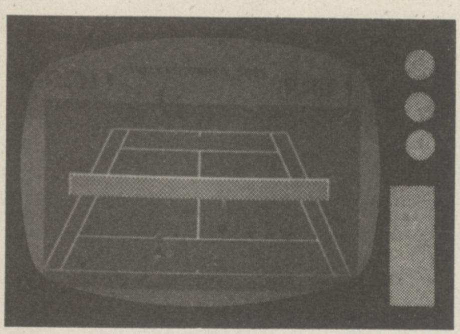

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SAVAGE POND

Written in Machine Code, this game claims to be semi-educational in that it teaches the player the life cycle of the frog – not to mention the underwater hazards of dragonfly larvae and pollution. You start off as a tadpole and your first task is to eat as many amoeba as possible while avoiding the deadly larvae and hydra.

More hazards appear as you progress, such as jelly fish and radio active waste.

Once you have developed into a frog, you battle dragonflies and later mutant bees. A visit from a female frog produces spawn which hatches out to continue the development of the colony.

Savage Pond is an original and addictive game which can't help but to bring a smile to your face. The graphics are amusingly realistic. Most of the action is controlled by a joystick, but the game becomes multi-action with the frog's long, sticky tongue being operated by pressing the space bar. The joystick is not very responsive, but in some ways this adds to the addiction of the game.

The accompanying 8-page booklet is as amusing as the game itself.

Title: Savage Pond
Programmer: Gwyll Jones

Company: Starcade, 2 Elworthy Avenue, Knowsley, Merseyside L26 7AA. Tel: 051-487 0808

Hardware: CBM64, cassette recorder, joystick
Type of game: Semi-educational

Graphics: ****
Sound: ***
Playability: ****

Description: Breed as many frogs as you can without being killed off by natural hazards.

Price: £8.95
CCI Rating: ****

AMBUSH

Ambush is very much a space game, requiring fierce fighting tactics to deal with all the alien zapping and manouvring involved in the game.

On your way from one mothership to another, your fighter space craft is attacked by alien forces. These come in various guises – gruesome masks, birds, sea horses and they try to destroy you by either ramming or bombing the ship. At first they attack one at a time and it is fairly easy to kill them with the laser cannon, but on the seventh wave there seems to be a never ending supply and you will need a great deal of nerve, quick reactions and accurate firing to succeed, especially as they split into two when hit making them doubly dangerous. On the completion of seven waves, you redock and are re-armed with an even more powerful laser cannon. On the 24th level you get a twin laser cannon.

The graphics are quite interesting, the sound adequate and for all those keen on fast action arcade games this is for you.

Title: Ambush
Programmer: Brian Williams
Company: Virgin Games
Hardware: 64, cassette recorder, joystick optional

Type of game: Arcade
Graphics: **
Sound: **
Playability: ***

Description: Zap the aliens and reach your mothership
Price: £7.95
CCI rating: ***

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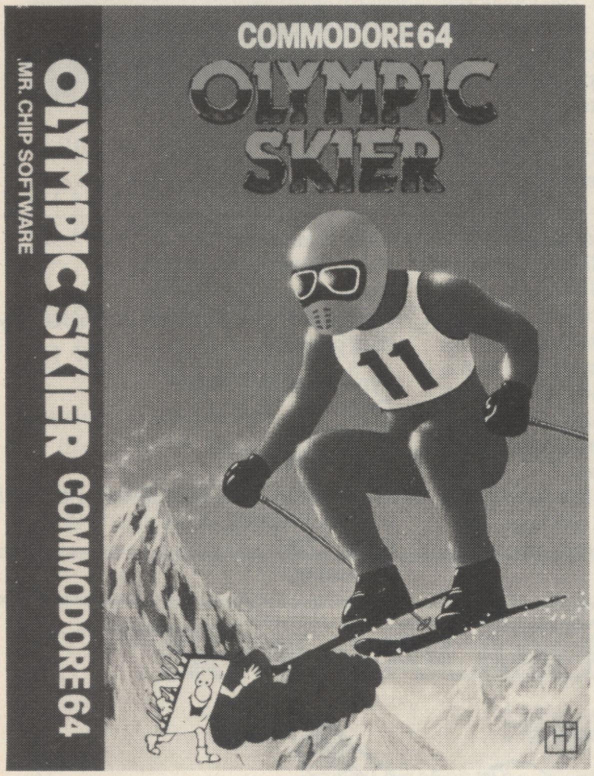
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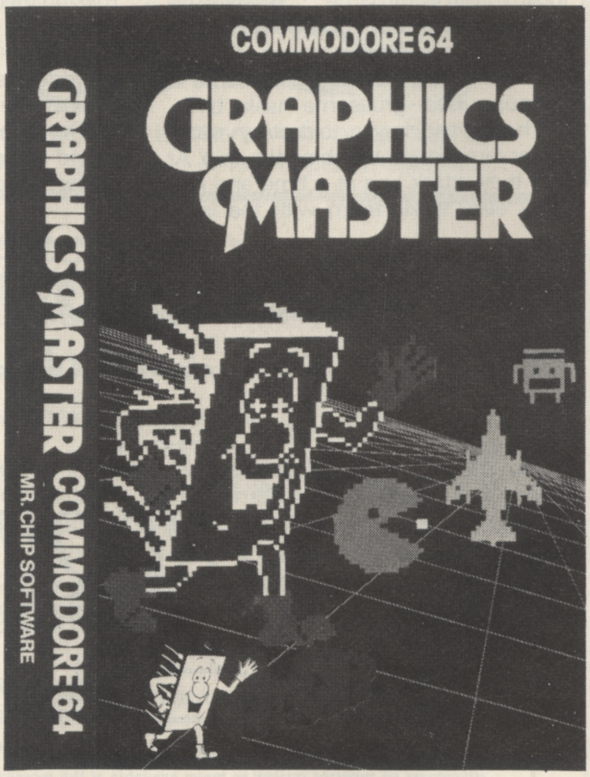
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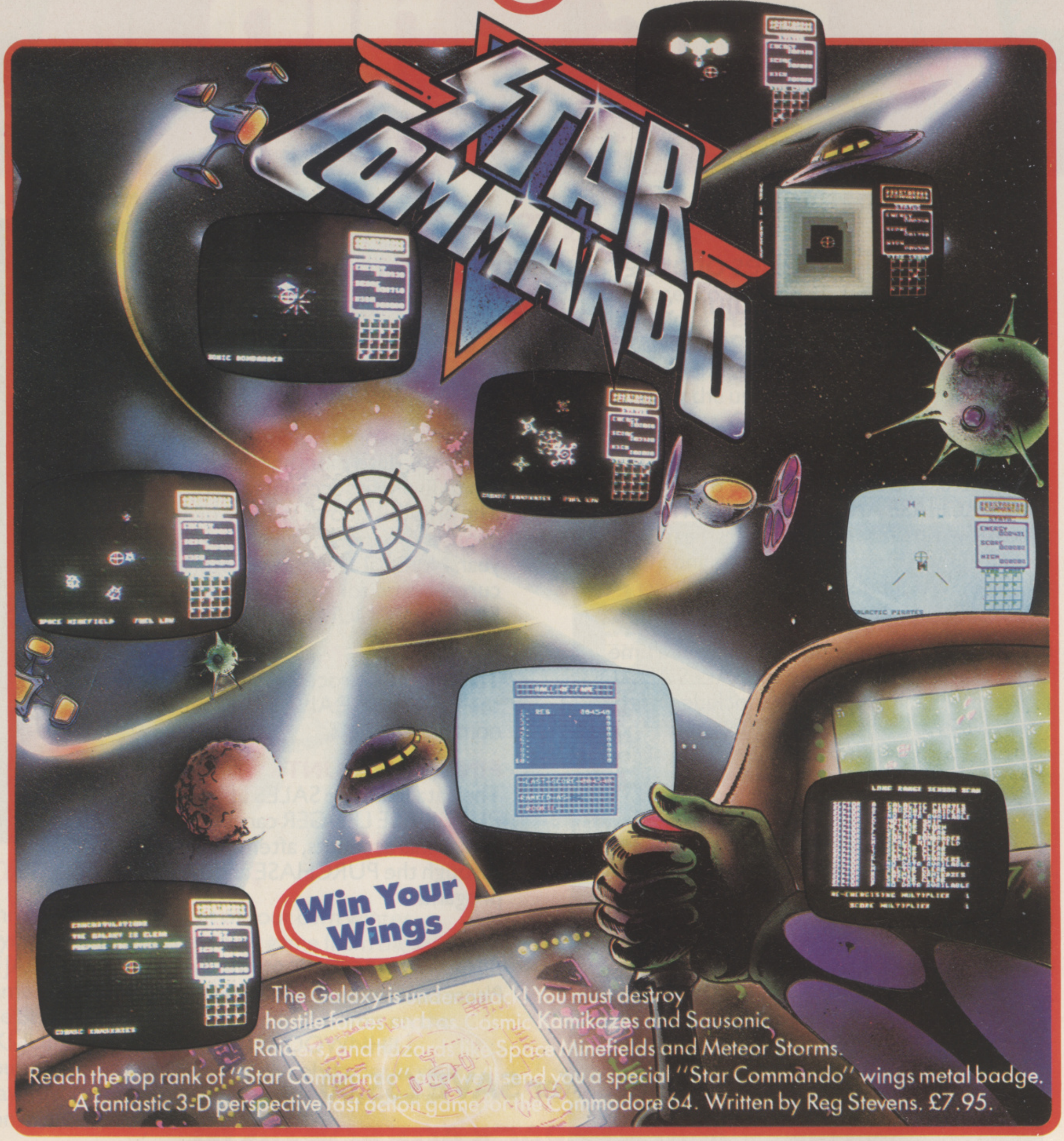
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Terminal Software, Derby House, Derby Street, Bury BL9 0NW, Manchester, England. Tel. 061-761-4321

KILLER WATT

Action takes place in an underground cavern. The player guides a submarine, using the joystick or keyboard, through the tunnels shooting fish and assorted strange creatures and avoiding collision with the walls and obstacles. The goal is to shoot all the balls hanging from the tunnel, get to the end and press a special button for entry onto the next level.

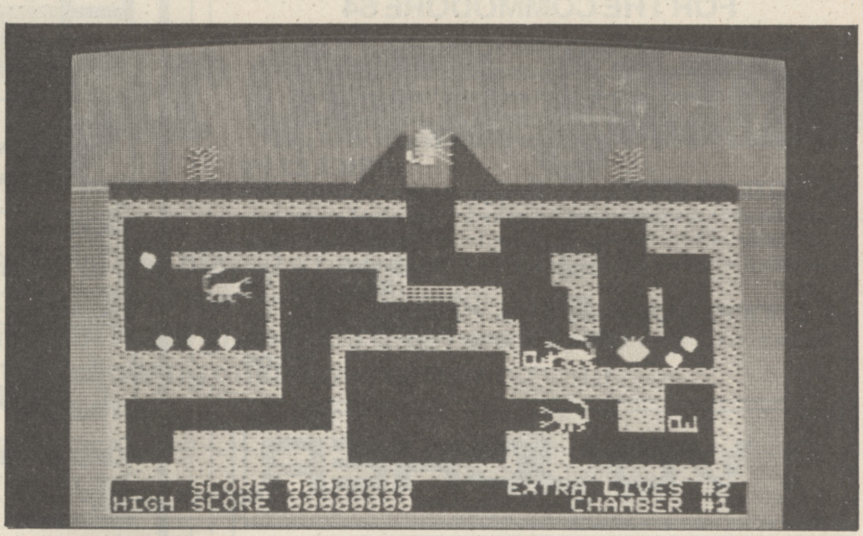
The game is graded with five shield and play levels. At the lowest shield level the submarine can afford to bump into something, but only for a short period of time. With the highest play level the number of creatures to attack increases.

The joystick control is so sensitive that the player has complete control. The scrolling of the screen is extremely smooth, the graphics are colourful and precise, the layout is interesting – the whole game is a professional job and well worth playing.

Title: Killer Watt
Programmer: Tony Crowther
Company: Alligata, Superior Systems Ltd,
178 West Street, Sheffield S1 4E2
Hardware: CBM 64, cassette player and joystick optional

Type of game: Arcade
Graphics: *****
Sound: ****
Playability: *****

Description: Guide submarine through cavern, shooting balls and creatures to get to final button.
Price: £7.95
CCI Rating: *****



FIRE ANT

An ideal choice of game to launch Mogul's new software label. We had great fun playing Fire Ant and compared to some of the arcade games currently flooding the market, this one had originality, wit and lots of action – a rare combination.

The scene is set in an underground ants nest and the scorpions (convincingly realistic with their curly tails) have just overthrown the colony and captured the Queen Ant. You, the last of the ants must negotiate eight nest chambers evading scorpions, collecting objects and breaking the barriers down.

The graphics are realistic and the sight and sound of the ant trotting along the tunnels is amusing.

Some careful thought is required (always a good sign in a game) and a combination of good timing, strategy and the correct manipulation of objects lying around – eggs, food, bits of wood, golden keys, amulets rendering scorpions harmless for a few seconds will result in the unblocking of the tunnels. I didn't get as far as the eighth chamber, but each level involves more cunning and skill as you go. A must for any collection.

Title: Fire Ant
Programmer: Michael Wacker
Company: Mogul Communications Ltd,
90 Regents Street, London W1
Tel: 01-437 3156
Hardware: 64, cassette recorder and joystick necessary
Type of Game: Arcade
Graphics: ****
Sound: ***
Playability: *****
Description: A lone ant must capture the Ant Queen from the invading Scorpions' clutches.
Price: £7.95
CCI Rating: ****

OMEGA RUN

The world is at war and your task is to prevent worldwide destruction by destroying the bomb. This device is housed in a pink silo and set to go off in 25 minutes.

Enemy defences in the form of fighter aircraft, anti-aircraft fire and ground to air missiles are the real danger. You are piloting a fighter and have quite a number of factors to consider to complete the mission successfully. Piloting the plane has been made as realistic as possible, by displaying an array of gauges and the aircraft windscreen's view. If the plane veers to one side, dives or climbs, the angle of the sky and ground changes.

Instructions accompanying the game are detailed and explain exactly what everything's for. The array of controls – fuel supply, power indicator, altitude, altimeter, clock (counting down), map (shows aircraft position), mirror, direction indicator and the number of bombs left on board all help you to combat the enemy and complete the mission. Additional factors in the game (for instance flying above 200 feet leaves you vulnerable to attack from enemy) make it more interesting.

Beginners have the option of customising the level they play at by choosing their level of vulnerability, target distance or else stick to levels one to five.

A lot of care has been taken to make the game as close to reality as possible and it will appeal to anyone who enjoys fast action games which involve some thought and strategy.

Title: Omega Run
Programmer: Richard Brisbourne
Company: Computer Rentals Ltd, CRL House, 9 Kings Yard, Carpenters Road, London E15 2HD. Tel: 01-533 2918.
Hardware: 64, cassette recorder and joystick optional

Type of game: Simulation
Graphics: ****
Sound: ***
Playability: ****

Description: Pilot fighter through enemy defences and destroy bomb

Price: £7.95
CCI Rating: ****

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Write your own game

How many times have you played a new computer game and thought you could have written a better game yourself? This month we're giving you the chance to do just that with the following guidelines to writing your own arcade game

Obviously your first move is to think up an idea for a game. Try to be as original as possible and develop a game that doesn't resemble anything on the market.

You will probably find it helps to write everything down on paper before typing it onto the computer. Think everything through before you get carried away in a fit of enthusiasm only to discover that your brilliant idea doesn't work at a later stage.

Bear in mind that a game should be challenging to even the most skilful player. Most successful games have a number of different levels, whether they're simply faster versions of the first level, or completely new and different scenarios. On the other hand a brilliant piece of programming which is very difficult to play will soon bore people.

Keep it simple. Most people prefer a joystick-operated game, but by all means keep both options open. When planning the keyboard layout make it straightforward and don't have people hunting all over the keyboard to find the right key in moments of panic.

Having got the idea down on paper, the next step is to transfer it to the screen. A lot of thought is needed to program an addictive game and it is often the little touches that help. The golden rule of graphics is to keep everything moving and changing.

The most important piece of design work in a games program are the major characters in the game. There is much scope for imagination here, especially with the graphics capabilities of a computer such as the 64. Don't give up if graphics design is your weak point – there is a variety of software available in the form of sprite editors and suchlike. One of the best we have seen is Romik's Graphics Editor. Due for release in the next couple of months, it features a character editor, sprite editor and also a screen editor.

Continuity is also a key factor. What will your characters do? Will they home in on you or wander down the screen? Where do they reappear if they go off the screen? Once you have decided, stick to that decision. No-one likes a game where movement of the various objects on the screen follows different rules from time to time.

You must also decide what will happen when characters collide. Will they sail past each other or will something happen to them. The important thing is to always keep something on the move to hold the attention of the player.

In addition to these rules of movement, it is also necessary to keep track of where the characters have moved to. How else will you know whether an enemy has been destroyed or not if you don't know where it's moved to?

This sort of thing is fairly easy with the 64, as there are routines to look after character collision assuming that everything has been designed in sprite form. Sprites may not solve your design and movement problems, but they will make life easier.

A scoring strategy is purely a matter of personal preference – whether you decide to award low or high points for zapping. You must also decide if there is to be a time limit to your game, such as fuel running out. As you can never beat an arcade game, the only incentive to keep going is to better your score. You will have to keep track of high scores. Ten should be sufficient with perhaps room to enter the player's name as well.

Your next consideration is the addition of sound. Good use of sound can really enhance a game and make it into something special. Sound is perhaps the most difficult feature to perfect. It must suggest impending action to assist the beginner, yet avoid antagonising the advanced player. It is also worth considering a prompt at the beginning of the game that allows the player to select a no-sound option.

Trial and error is the only way to perfect different sounds for each character and action. Distinct sounds suggest a hit, longer lower-frequency sounds suggest slow action, and high-pitched short sounds suggest fast action. Sliding frequencies represent continual motion.

Try to make your sounds as pleasing as possible and avoid shifting from low to high frequencies too abruptly as this soon becomes irritating.

Once you have got graphics design, movement and sound out of the way, you can start thinking about a title screen. This can be as simple as the name of the game and the programmer or a spectacular and colourful display.

We haven't mentioned colour yet. It should be added after the action, title and sound have been programmed and de-bugged. Generally, colour should be used to minimise the player's frustrations. Consistency is a key to proper use of high-contrast and subdued colours. Critical features and anything that's urgent should stand out clearly, whereas features that aren't viewed often and don't change much should be consistently subdued.

Be careful with the colours of adjacent characters as the eye is easily fooled by contrasts. Try also to avoid filling the outside display area.

The first game you write will be the hardest, but once you start to build up routines that can be used again it will get easier. Throughout the process of writing your own game you must continually test each and don't forget to keep backup files in case of accidents.

Good luck!

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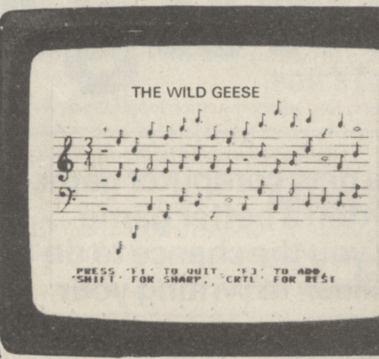

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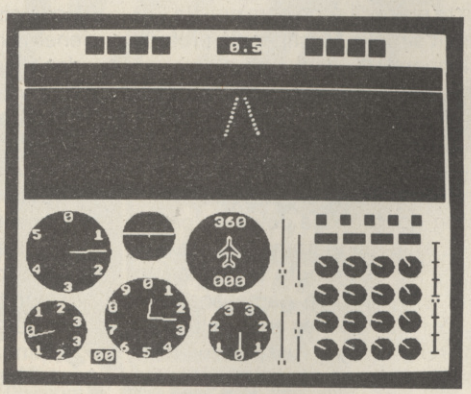

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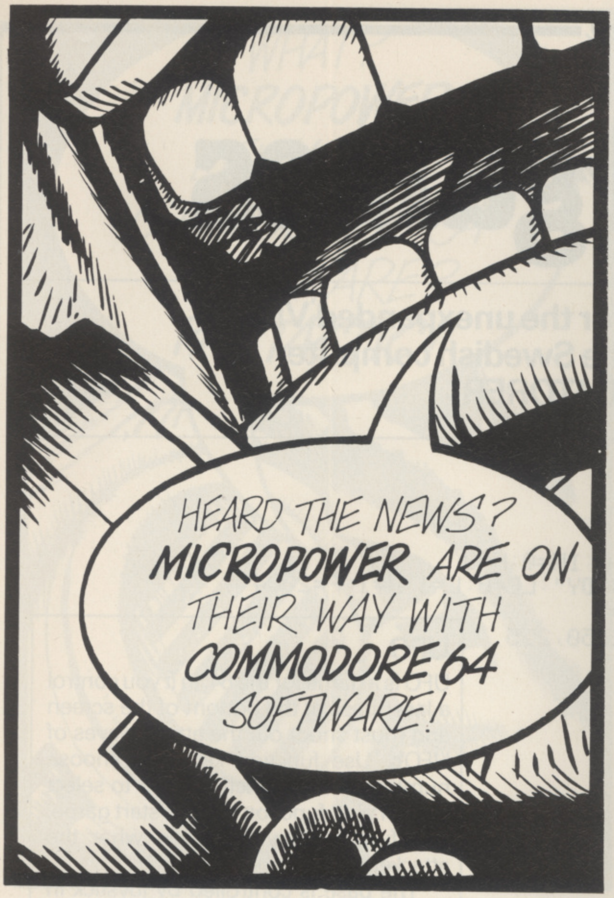
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Fun and games

This month we have a game for the unexpanded VIC-20 courtesy of Bo Svensson, of the Swedish computer magazine HEMDATORER

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10 GOSUB1550:HI=0:DIMA(3):POKE53281,0:POKE53280,0:IN=0:H=0
20 PRINT"J";:CO=54272:GOSUB1170:PRINT"J":B$="NOBODY":LE=0:L=1:W=1:P=2004
30 PRINT"QQQ▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶|≡YZ][":IO=1:O=1:S=0
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100 GETA$:IFA$=""THEN170
110 GOSUB1090
120 IFA$="■"THENW=W+1:LE=LE+1
130 IFA$="■"THENL=L+1
140 IFL>4THENL=1
150 IFW>5THENW=1:LE=1
160 IFA$="■"THEN190
170 IFA$="■"THEN1310
180 PRINT"S":GOTO30
190 PRINT"J":W=W-1
200 PRINTTAB(26);:FORI=1TOL:PRINT"J+, ";:NEXTI
210 FORI=0TO3:A(I)=1064+INT(RND(1)*40):IFI<3THENS(I)=0
220 NEXTI
230 C1=24:C2=0:C3=24:N=4
240 W=W+1:IFW>15THENW=1:PRINT"SQQQQQ▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶▶*** 50000 ***":GOSUB780
250 IFW=15THENC1=32:C2=0:C3=32
260 IFW=12THENC1=32:C2=11:C3=32
270 IFW=13THENC1=12:C2=12:C3=12
280 IFW=14THENC1=15:C2=15:C3=32
290 IFW=2THENC1=24:C2=1:C3=24
300 IFW=8THENC1=7:C2=7:C3=7
310 IFW=9THENC1=8:C2=8:C3=32
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350 IFW=4THENC1=24:C2=3:C3=24
360 IFW=5THENC1=4:C2=4:C3=4
370 IFW=6THENC1=5:C2=5:C3=5
380 IFW=7THENC1=6:C2=6:C3=6
390 FORI=0TO2STEP2
400 IFIN=0THENSP=NOTPEEK(56321)AND15
410 IFIN=0THENSD=PEEK(56321)AND16
420 IFIN=0ANDSD=0THEN610
430 POKEP-1,32:POKEP,32:IF(SPAND8)THENP=P+2
440 IF(SPAND4)THENP=P-2
450 IFIN=1THENGOSUB1510
460 IFU=2THENPOKEP-1,43:POKEP,44:GOTO610
470 IFP<1985THENP=1985
480 IFP>2023THENP=2023
490 POKEP-1+CO,3:POKEP+CO,3
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UFO

UFO is a game for the 64. In it you control a laser base at the bottom of the screen and must shoot out the attack waves of UFO's. Use function key 1 to choose number of lives, function key 3 to select level of play, function key 5 to start game, and function key 7 to see what the attackers look like.

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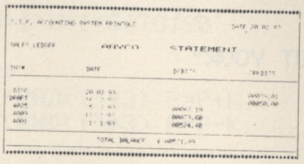

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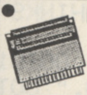

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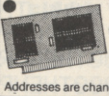

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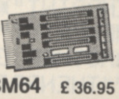

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```
500 POKEP-1,43:POKEP,44
510 FORJ=ITOI+1:IFA(J)=0THEN590
520 POKEA(J)-1,32:POKEA(J),32:POKEA(J)+1,32
530 IFW>12THEND1=3:D2=78
540 A(J)=A(J)+INT(RND(1)*D1+D2)
550 O=O+1:IFO>16THENO=1
560 IFA(J)>1944THEN750
570 POKEA(J)-1+CO,O:POKEA(J)+CO,O:POKEA(J)+1+CO,O
580 POKEA(J)-1,C1:POKEA(J),C2:POKEA(J)+1,C3
590 NEXTJ
600 IFK<>36THEN730
610 POKE54296,15:POKE54277,15:POKE54278,180:POKE54276,129
620 POKE54273,50:POKE54272,80
630 FORX=P-40TO1064STEP-40:POKEX+CO,7:IFPEEK(X)=32THEN720
640 POKEX+CO-41,1:POKEX+CO+41,1:POKEX+39+CO,1:POKEX-39+CO,1
650 POKE53281,2:POKEX,42:POKEX-41,41:POKEX-39,41:POKEX+41,41:POKEX+39,41
660 POKE54277,30:POKE54278,200:POKE54276,129:POKE54273,15:POKE54272,85
670 FORTY=0TO100:NEXTTY:POKE54276,0
680 FORY=0TO3:IFA(Y)=XTHENPOKEX-1,32:POKEX+1,32:S=S+100*W:A(Y)=0:N=N-1
690 IFA(Y)<>X+1ANDA(Y)<>X-1THEN710
700 POKEX+1,32:POKEX-1,32:POKEX-2,32:POKEX+2,32:A(Y)=0:S=S+50*W:N=N-1
710 NEXTY:POKE53281,0:POKEX,32:POKEX-41,32:POKEX-39,32:POKEX+41,32:POKEX+39,32
720 POKEX,45:NEXTX:FORX=P-40TO1064STEP-40:POKEX,32:NEXT:POKE54276,0
730 NEXTI:PRINT"▨≡##$%"S" !)#$%"HI:IFN>0THEN390
740 GOTO210
750 GOSUB1130:FORI=1TO1000:NEXT:L=L-1:IFL>0THENPRINT"▯";:W=W-1:GOTO200
760 POKE650,0
770 GOTO800
780 FORG=0TO2000:NEXT:S=S+50000:PRINT"▨▨▨▨▨▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮                "
790 RETURN
800 POKE53272,21:IFS>HITHENHI=S:GOTO820
810 GOTO890
820 PRINT"▯":POKE54296,15:POKE54277,32:POKE54278,255
830 POKE54277+7,32:POKE54277+14,32:POKE54278+7,255:POKE54278+14,255
840 POKE54276+7,33:POKE54276+14,33:POKE54276,33:FORTY=2000TO26000STEP240
850 POKE54273,TY-INT(TY/256)*256:POKE54273+7,8:POKE54273+14,6
860 PRINT"▮▮▮▮▮▮▮▮▮▮▮≡***▨ H▮I▮G▮H▮E▮S▮T▮ S▮C▮O▮R▮E ≡***"
870 NEXTTY:POKE54296,0:POKE54276,0:POKE54276+7,0:POKE54276+14,0:PRINT"▯"
880 POKE198,0:INPUT"YOUR NAME, PLEASE";B$
890 PRINT"▯"
900 IFLEN(B$)>15THEN880
910 POKE53280,5:PRINT"▨▨▨▮YOUR SCORE IS"S
920 PRINT"▨▮▮HI-SCORE IS"HI
930 PRINT"▨▮▮AND▨ "B$" ≡HAS HI-SCORE."
940 PRINT"▨▨▮≡THE ▨COMPUTER▬≡ THINKS THIS ABOUT YOUR"
950 PRINT"▨▮▮PLAYING."
960 IFS<200THENPRINT"▨▮▮HA,HA,HA":GOTO1050
970 IFS<1000THENPRINT"▨▮▮VERY BAD.":GOTO1050
980 IFS<5000THENPRINT"▨▮▮BAD.":GOTO1050
990 IFS<10000THENPRINT"▨▮▮GOOD.":GOTO1050
1000 IFS<25000THENPRINT"▨▮▮VERY GOOD.":GOTO1050
1010 IFS<50000THENPRINT"▨▮▮SMASHING.":GOTO1050
1020 IFS<100000THENPRINT"▨▮▮SUPER PLAYER.":GOTO1050
1030 IFS<250000THENPRINT"▨▮▮TERRIFIC."
1040 IFS<1000000THENPRINT"▨▮▮SPECIAL CLASS."
1050 PRINT"▨▨▮▮▨ANOTHER GAME. (Y/N)"
1060 GETA$:IFA$="Y"THENPRINT"▯":GOTO20
```

```
1070 IFA$="N"THENEND
1080 GOTO1060
1090 POKE54296,15:POKE54276,17:POKE54277,90:POKE54278,180
1100 POKE54273,190:POKE54272,80
1110 FORG=0TO5:NEXTG
1120 POKE54276,0:RETURN
1130 FORTY=230TO0STEP-5:POKE54277,40:POKE54278,180:POKE54276,17
1140 POKE54273,TY:POKE54272,60:FORYT=0TO25:NEXTYT:NEXTTY:POKE54276,0
1150 IFIN=1THENIN=0:GOTO20
1160 RETURN
1170 POKE53272,30:POKE53280,0:PRINT"╦QQ▶▶▶▶▶▶▶▶▶▶▶▶O▶▶O▶⊠OOOOO▶◘OOOOO"
1180 PRINT"▶▶▶▶▶╦▶▶▶▶▶O▶▶▶O⊠O▶▶▶▶▶◘O▶▶▶O"
1190 PRINT"▶▶▶▶▶▶▶▶▶╦O▶▶▶O▶▶⊠OOO▶▶▶▶◘O▶▶▶O"
1200 PRINT"▶▶▶▶▶▶▶▶▶╦O▶▶▶O▶⊠O▶▶▶▶▶▶◘O▶▶▶O"
1210 PRINT"▶▶▶▶▶▶▶▶▶▶╦OOOOO▶⊠O▶▶▶▶▶▶◘OOOOO"
1220 POKE54277,33:POKE54277+7,33:POKE54277+14,33
1230 POKE54278,255:POKE54278+7,255:POKE54278+14,255
1240 POKE54296,15:POKE54276,33:POKE54276+7,33:POKE54276+14,33
1250 FORV=0TO50:B=RND(1)*(7-3)+3:POKE54273,B:POKE54273+7,B:POKE54273+14,B
1260 GETA$:IFA$="■"THEN1290
1270 POKE54272,6
1280 FORC=0TO80:NEXTC:NEXTV
1290 POKE54276,0:POKE54276+7,0:POKE54276+14,0
1300 RETURN
1310 PRINT"╦Q▶▶▶▶▶▶▶▶▌:;<▐1▐=▐X@X"
1320 PRINT"■▶▶▶▶▶▶▶▌:;<▐2▐=▐XAX"
1330 PRINT"▒▶▶▶▶▶▶▶▌:;<▐3▐=▐XBX"
1340 PRINT"╦▶▶▶▶▶▶▶▌:;<▐4▐=▐XCX"
1350 PRINT"■▶▶▶▶▶▶▶▌:;<▐5▐=▐DDD"
1360 PRINT"▒▶▶▶▶▶▶▶▌:;<▐6▐=▐EEE"
1370 PRINT"╦▶▶▶▶▶▶▶▌:;<▐7▐=▐FFF"
1380 PRINT"■▶▶▶▶▶▶▶▌:;<▐8▐=▐GGG"
1390 PRINT"▒▶▶▶▶▶▶▶▌:;<▐9▐=▐HH"
1400 PRINT"╦▶▶▶▶▶▌:;<▐10▐=▐II"
1410 PRINT"■▶▶▶▶▶▌:;<▐11▐=▐J"
1420 PRINT"▒▶▶▶▶▶▌:;<▐12▐=▐K"
1430 PRINT"╦▶▶▶▶▶▌:;<▐13▐=▐???"
1440 PRINT"■▶▶▶▶▶▌:;<▐14▐=▐??"
1450 PRINT"▒▶▶▶▶▶▌:;<▐15▐=▐?"
1460 PRINT"═Q▶▶▶▶▶▶P▐QRSTUV"
1470 GETA$:IFA$="▌"THENPRINT"▯":GOTO30
1480 IFH=1THEN1500
1490 IFA$="▌"THENIN=1:H=1:GOTO190
1500 GOTO1470
1510 U=INT(RND(1)*3)
1520 IFU=1THENK=INT(RND(1)*3):P=P+K
1530 IFU=2THENK=INT(RND(1)*3):P=P-K
1540 RETURN
1550 FORI=14336TO14847:READA:POKEI,A:NEXT:POKE53272,30:RETURN
1560 DATA255,153,153,255,24,24,24,24
1570 DATA153,255,129,255,24,126,219,153
1580 DATA24,60,102,231,231,60,24,0
1590 DATA0,60,102,255,126,60,24,0
1600 DATA126,129,126,195,231,24,255,24
1610 DATA126,195,126,195,231,0,0,0
1620 DATA24,36,102,219,219,102,36,24
1630 DATA255,153,255,60,231,195,129,0
```

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1640 DATA60,255,129,255,102,102,24,60
1650 DATA0,24,60,102,195,126,0,0
1660 DATA0,24,60,102,219,90,24,60
1670 DATA0,62,195,129,195,126,24,60
1680 DATA0,62,195,129,195,126,0,0
1690 DATA99,119,127,107,99,99,99,0
1700 DATA102,118,126,126,110,102,102,0
1710 DATA24,60,24,255,153,60,102,195
1720 DATA24,25,27,30,28,222,219,249
1730 DATA0,0,0,123,66,122,10,123
1740 DATA0,0,0,239,108,110,108,236
1750 DATA0,0,0,122,50,51,51,49
1760 DATA0,0,0,38,169,239,233,233
1770 DATA0,0,0,115,75,115,83,75
1780 DATA0,0,0,224,0,128,0,224
1790 DATA99,99,99,107,127,119,99,0
1800 DATA0,0,0,255,153,153,255,0
1810 DATA7,3,15,3,7,1,3,15
1820 DATA205,205,205,205,205,205,205,253
1830 DATA252,15,14,15,8,15,12,254
1840 DATA0,0,0,134,134,134,134,246
1850 DATA251,131,131,227,227,131,131,131
1860 DATA0,0,0,247,132,198,132,135
1870 DATA0,0,0,120,64,120,8,120
1880 DATA0,0,0,0,0,0,0,0
1890 DATA0,0,0,219,219,251,219,219
1900 DATA102,102,102,0,0,0,0,0
1910 DATA0,0,0,247,132,244,20,247
1920 DATA0,0,0,119,85,86,85,117
1930 DATA0,0,0,120,64,112,64,120
1940 DATA0,0,60,60,60,60,0,0
1950 DATA1,1,1,1,1,1,1,1
1960 DATA128,128,128,128,128,128,128,128
1970 DATA0,0,0,0,60,60,0,0
1980 DATA129,90,36,90,90,36,90,129
1990 DATA0,1,3,65,225,67,127,63
2000 DATA0,128,192,130,135,194,254,252
2010 DATA48,48,48,48,48,48,48,48
2020 DATA12,12,12,12,12,12,12,12
2030 DATA0,3,6,12,24,48,96,0
2040 DATA126,66,66,66,66,66,66,126
2050 DATA24,56,24,24,24,24,60,60
2060 DATA126,2,2,126,64,64,64,126
2070 DATA126,2,2,14,14,2,2,126
2080 DATA102,102,70,127,127,6,6,6
2090 DATA126,64,64,126,2,2,2,126
2100 DATA126,64,64,126,66,66,66,126
2110 DATA127,3,6,12,12,12,12,12
2120 DATA126,66,66,126,126,66,66,126
2130 DATA126,66,66,126,6,6,6,6
2140 DATA0,0,0,199,196,198,196,247
2150 DATA0,0,0,75,74,75,122,51
2160 DATA0,0,0,176,48,48,48,188
2170 DATA0,0,126,0,126,0,0,0
2180 DATA112,24,12,6,12,24,112,0
2190 DATA60,102,6,12,24,0,24,0
READY.
```

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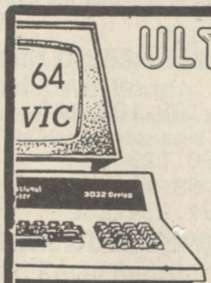

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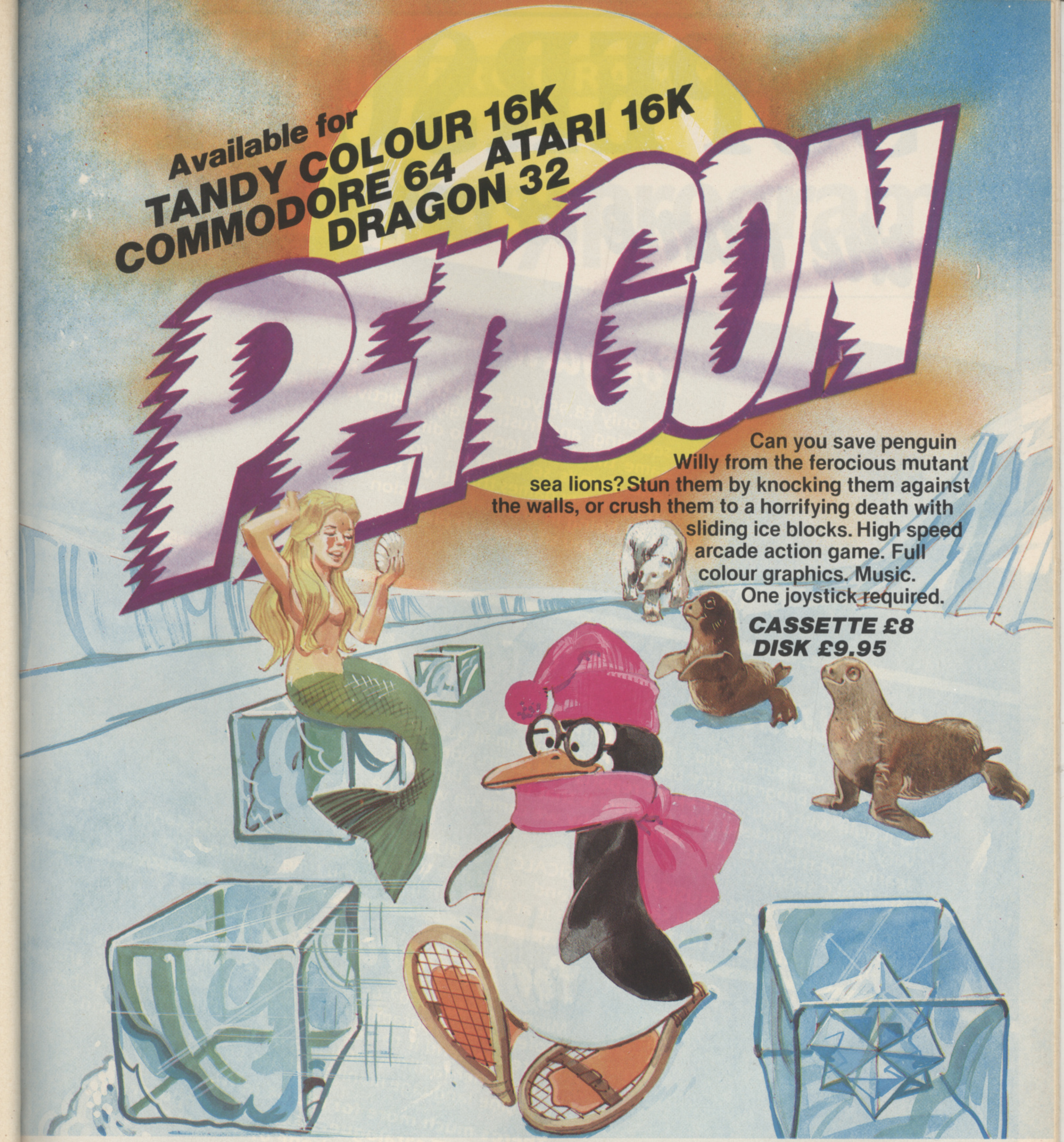
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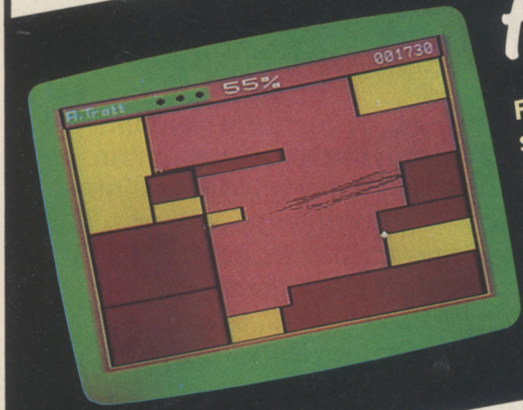
for games



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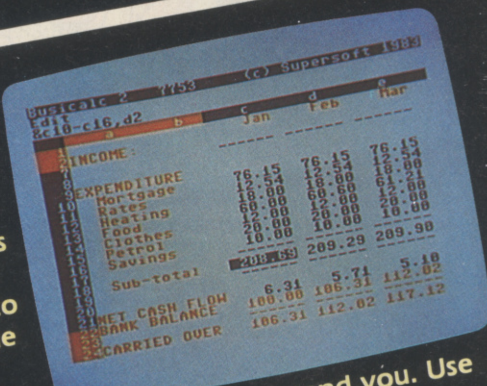

```
Busicalc 2    7753         (c) Supersoft 1983
Edit                   c         d         e
&c10-c16,d2           Jan       Feb       Mar
       a         b
                     ------    ------    ------
 1
 2INCOME:
 7
 8EXPENDITURE
 9  Mortgage          76.15     76.15     76.15
10  Rates             12.54     12.54     12.54
11  Heating           18.00     18.00     18.00
12  Food              60.00     60.60     61.21
13  Clothes           12.00     12.00     12.00
14  Petrol            20.00     20.00     20.00
15  Savings           10.00     10.00     10.00
16                   ------    ------    ------
17  Sub-total        208.69    209.29    209.90
18                   ------    ------    ------
19
20NET CASH FLOW        6.31      5.71      5.10
21BANK BALANCE       100.00    106.31    112.02
22                   ------    ------    ------
23CARRIED OVER       106.31    112.02    117.12
```

for business

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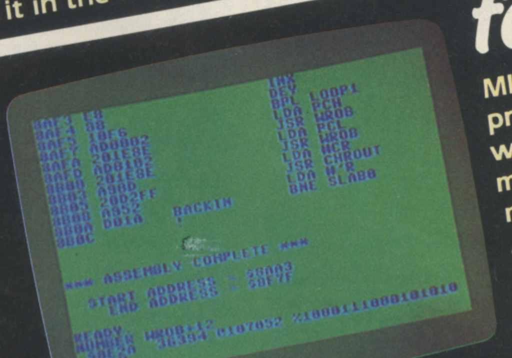

```
8AF3 E8                INX
8AF4 88                DEY
8AF5 10F6              BPL  LOOP1
8AF7 AD0B02            LDA  PCH
8AFA 201E8E            JSR  WROB
8AFD AD0102            LDA  PCL
8B00 201E8E            JSR  WROB
8B03 A90D              LDA  #CR
8B05 20D2FF            JSR  CHROUT
8B08 A952              LDA  #'R
8B0A D01A              BNE  SLAB0
8B0C        BACKIN
            !

*** ASSEMBLY COMPLETE ***

START ADDRESS = $8AA3
  END ADDRESS = $8F7F

READY.
NUMBER WROB+12
 36394 @107052 %1000111000101010
 $8E2A
READY.
```

for programmers

MIKRO is a full 6502/6510 ASSEMBLER with the power that professional programmers need, yet so simple to use that we recommend it to beginners! The MIKRO cartridge has many other facilities including editing commands and a machine language monitor, all for £57.50.

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The Best 64 Software

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Desk diary program

Last month we published the first of a desk diary and calendar program written by GP Raven. The following listing completes that program

```
315 gosub355:dy=0:dclose#11:return
316 sys32314:return
317 sys32314
318 ifdy=0thengosub300
319 en=0:ifn=0thenreturn
320 forj=1to15:ex$(j)="":next
321 forj=0ton-1
322 ifen=15thenj=n-1:goto324
323 ifmid$(zs$(j),54,6)=left$(dt$,6)thenen=en+1:ex$(en)=zs$(j)
324 nextj
325 return
326 y1=1900:ifval(y$)>1999theny1=2000
327 am$="312831303130313130313031"
328 al$="312931303130313130313031"
329 p6=0
330 ifmid$(dt$,2,1)="/"thendt$="0"+dt$
331 pd=val(left$(dt$,2))
332 ifmid$(dt$,5,1)="/"thendt$=left$(dt$,3)+"0"+right$(dt$,4)
333 pm=val(mid$(dt$,4,2))
334 py=val(right$(dt$,2))
335 iflen(dt$)<>8thenp6=1:return
336 ifpm<1orpm>12orpy<>val(right$(y$,2))orpd<1orpd>31thenp6=1
337 ar=y1+py:ifint(ar/4)=ar/4thenam$=al$
338 ifpd>val(mid$(am$,pm*2-1,2))thenp6=1
339 return
340 st$="th ":db=val(mid$(da$(fi),2,2))
341 ifdb=1ordb=21ordb=31thenst$="st "
342 ifdb=2ordb=22thenst$="nd "
343 ifdb=3ordb=23thenst$="rd"
344 tt$=wk$(val(left$(da$(fi),1)))+" "+mid$(da$(fi),2,2)+st$
345 tt$=tt$+m$(val(mid$(da$(fi),4,2)))+" "+y$
346 gosub294
347 gosub317
348 print"▒▒▒"
349 print"▒Time▒    ▒Event▒                ▒Details▒"
350 ifen=0thenreturn
351 forq=1toen
352 printmid$(ex$(q),4,4)spc(5)mid$(ex$(q),8,15)
    spc(10)mid$(ex$(q),23,30)
353 nextq
```

```
354 return
355 ifds<20thenreturn
356 ifds=62thenreturn
357 ifds=63thenreturn
358 ifds=50thenreturn
359 wt=0
360 wt=0
361 col=1:lne=24:gosub364:printv$;bm$;b$;
362 ifwt=1thenforj=1to1500:next
363 return
364 col$="▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮"
365 lne$="▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨"
366 print"▣";
367 ifcol>1thenprintleft$(col$,col-1);
368 iflne>1thenprintleft$(lne$,lne-1);
369 return
370 data"January",31
371 data"February",28
372 data"March",31
373 data"April",30
374 data"May",31
375 data"June",30
376 data"July",31
377 data"August",31
378 data"September",30
379 data"October",31
380 data"November",30
381 data"December",31
382 data"Monday","Tuesday","Wednesday","Thursday","Friday"
383 data"Saturday","Sunday"
384 bm$="▣Are You Sure▪    y▮▮▮":gosub359:inputyn$
385 return
```

```
.M 7E3A 7ED4
.:   7E3A 48 98 48 8A 48 AD 2C 7E
.:   7E42 29 7F 8D 2C 7E AD 2D 7E
.:   7E4A 09 80 8D 2D 7E A9 00 8D
.:   7E52 2E 7E A5 2C 85 54 A5 2D
.:   7E5A 85 55 A0 00 B1 54 C9 24
.:   7E62 D0 08 A9 01 8D 2E 7E 4C
.:   7E6A AA 7F CD 2C 7E D0 08 C8
.:   7E72 B1 54 CD 2D 7E F0 1E A0
.:   7E7A 02 B1 54 8D 37 7E C8 B1
.:   7E82 54 8D 38 7E 18 A5 54 6D
.:   7E8A 37 7E 85 54 A5 55 6D 38
.:   7E92 7E 85 55 90 C5 A0 04 B1
.:   7E9A 54 C9 01 F0 08 A9 02 8D
.:   7EA2 2E 7E 4C AA 7F A0 05 B1
.:   7EAA 54 8D 30 7E C8 B1 54 8D
.:   7EB2 2F 7E AE 30 7E D0 0F AD
.:   7EBA 2F 7E C9 02 B0 08 A9 03
.:   7EC2 8D 2E 7E 4C AA 7F AD 2F
.:   7ECA 7E 8D 31 7E AD 30 7E 8D
.:   7ED2 32 7E A9 00 8D 39 7E 8D
.X
READY.
RUN
```

```
.:   7EDA 35 7E 8D 36 7E 38 AD 31
.:   7EE2 7E E9 01 8D 31 7E AD 32
.:   7EEA 7E E9 00 8D 32 7E AE 32
.:   7EF2 7E D0 0A AD 31 7E C9 00
.:   7EFA D0 03 4C AA 7F 18 A5 54
.:   7F02 69 07 85 56 A5 55 69 00
.:   7F0A 85 57 A0 00 B1 56 8D 33
.:   7F12 7E C8 B1 56 85 58 C8 B1
.:   7F1A 56 85 59 C8 B1 56 8D 34
.:   7F22 7E C8 B1 56 85 5A C8 B1
.:   7F2A 56 85 5B AE 34 7E F0 58
.:   7F32 AE 33 7E F0 2D A0 00 B1
.:   7F3A 58 D1 5A F0 05 90 49 4C
.:   7F42 64 7F C8 F0 43 CC 33 7E
.:   7F4A 90 04 F0 09 B0 07 CC 34
.:   7F52 7E 90 E4 F0 00 AD 33 7E
.:   7F5A CD 34 7E F0 2B 90 29 4C
.:   7F62 64 7F A0 00 AD 34 7E 91
.X

READY.

.:   7F6A 56 C8 A5 5A 91 56 C8 A5
.:   7F72 5B 91 56 C8 AD 33 7E 91
```

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Machine	BM1	BM2	BM3	BM4	BM5	BM6	BM7	BM8	Average
CBM with PETX2	0.87	5.1	9.4	10.3	11.2	16.5	26.0	6.0	17.5
IBM PC	1.5	5.2	12.1	12.6	13.6	23.5	37.4	3.5	17.6
Osborne 01	1.4	4.4	11.7	11.6	12.4	21.9	34.9	6.1	19.9
Apple 111	1.7	7.2	13.5	14.5	16.0	27.0	42.5	7.5	24.7
ACT Sirius 1	2.0	7.4	17.0	17.5	19.8	35.4	55.9	4.3	24.8
Apple 2	1.3	8.5	16.0	17.8	19.1	28.6	44.8	10.7	30.4
Commodore CBM 8032	1.7	10.0	18.4	20.3	21.9	32.4	51.0	11.9	34.3

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```
.:  7F7A 56 C8 A5 58 91 56 C8 A5
.:  7F82 59 91 56 A9 01 8D 39 7E
.:  7F8A EE 35 7E D0 03 EE 36 7E
.:  7F92 AD 35 7E CD 31 7E D0 16
.:  7F9A AD 36 7E CD 32 7E D0 0E
.:  7FA2 AE 39 7E F0 03 4C D4 7E
.:  7FAA 68 AA 68 A8 68 60 18 A5
.:  7FB2 56 69 03 85 56 A5 57 69
.:  7FBA 00 85 57 4C 0C 7F AA AA
.X
```

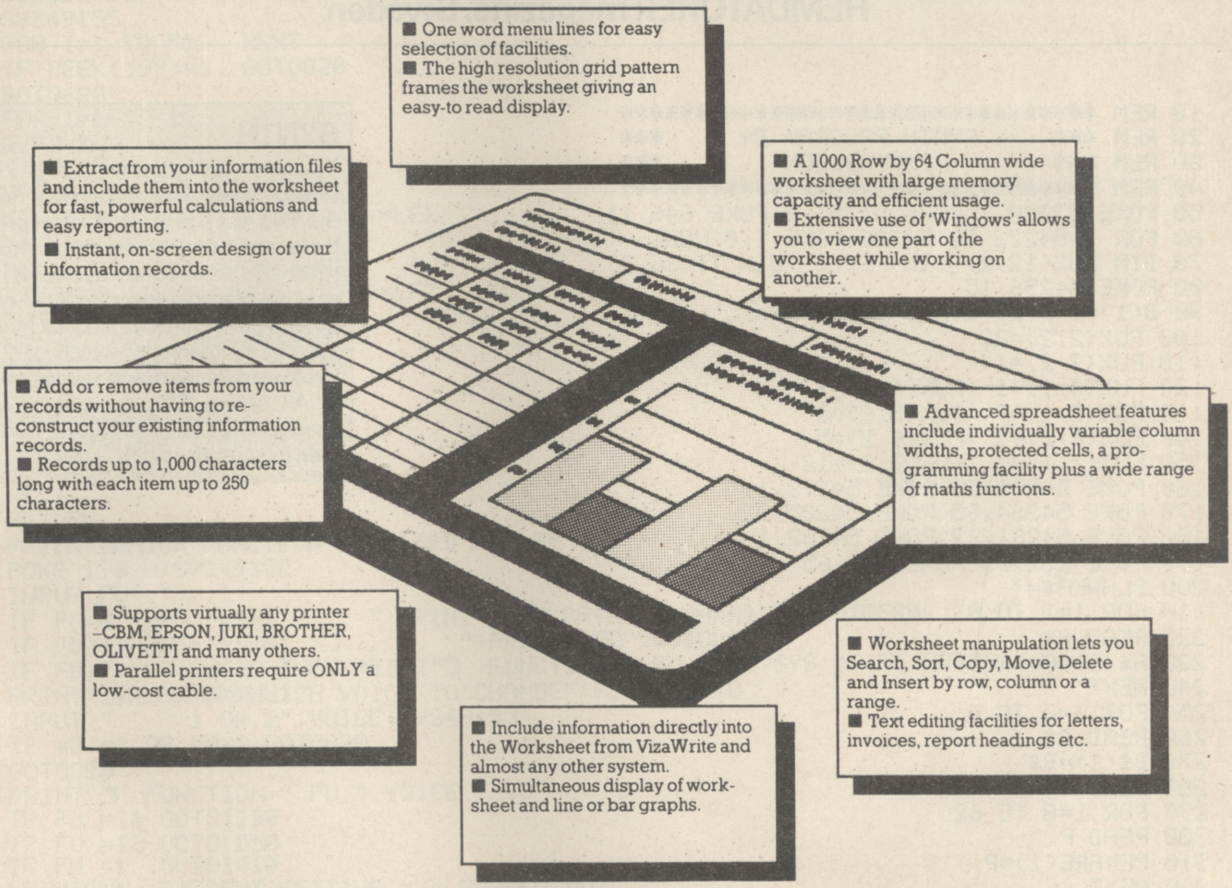
```
B*
   PC  IRQ  SR AC XR YR SP
.;  0005 E455 30 00 5E 04 F8
.M 0110 0131
.:  0110 A2 00 A9 79 9D 00 80 E8
.:  0118 E0 50 D0 F6 A9 66 9D 00
.:  0120 80 E8 E0 A0 D0 F6 A9 78
.:  0128 9D 00 80 E8 E0 F0 D0 F6
.:  0130 60 00 77 48 37 40 37 00
.X
```

```
TITLES.SRC......PAGE 0001

LINE# LOC   CODE         LINE


0001  0000               ;PROGRAM TO PRINT THREE LINE GRAPHIC SCREEN
0002  0000               ;HEADINGS
0003  0000               ;
0004  0000               SCRTOP=32768
0005  0000                      *=272
0006  0110  A2 00               LDX #0
0007  0112  A9 79        LOOP1  LDA #121
0008  0114  9D 00 80            STA SCRTOP,X
0009  0117  E8                  INX
0010  0118  E0 50               CPX #80
0011  011A  D0 F6               BNE LOOP1
0012  011C               ;
0013  011C  A9 66        LOOP2  LDA #102
0014  011E  9D 00 80            STA SCRTOP,X
0015  0121  E8                  INX
0016  0122  E0 A0               CPX #160
0017  0124  D0 F6               BNE LOOP2
0018  0126               ;
0019  0126  A9 78        LOOP3  LDA #120
0020  0128  9D 00 80            STA SCRTOP,X
0021  012B  E8                  INX
0022  012C  E0 F0               CPX #240
0023  012E  D0 F6               BNE LOOP3
0024  0130  60                  RTS
0025  0131                      .END

ERRORS = 0000


SYMBOL TABLE

SYMBOL VALUE
 LOOP1     0112     LOOP2     011C     LOOP3     0126     SCRTOP    8000


END OF ASSEMBLY
```

VIZASTAR 64

THE INFORMATION PROCESSOR

■ Spreadsheet ■ Database ■ Graphics



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SOFTWARE

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Synth sounds

In this month's Basic programming we have a program for the 64 called SYNTH courtesy of Bo Svensson, HEMDATORER magazine, Sweden

```
10 REM ********************************
20 REM ***      SYNTH PROGRAM BY      ***
30 REM ***        JAN NILSON          ***
40 REM ********************************
50 POKE 53280,7:POKE 53281,7:POKE 646,11
60 FOR I=54272 TO 54296:POKE I,0:NEXT
70 DIM FU%(12,2):DIM PE(70):DIM TT(36,2)
80 POKE 54296,15
90 B(1)=1:B(2)=2:A=0:C=6
100 FU%(2,2)=22
110 FU%(3,2)=1
120 FU%(4,1)=1 :FU%(4,2)=5
130 FU%(5,1)=7 :FU%(5,2)=5
140 FU%(6,1)=7 :FU%(6,2)=5
150 FU%(7,1)=4 :FU%(7,2)=12
160 POKE 54277,23:POKE 54278,116
170 POKE 54284,85:POKE 54285,92
180 POKE 54281,22:POKE 54282,1
190 POKE 252,33:POKE 253,65
200 BLANKA$="
210 FOR I=1 TO 8
220 READ A$,N
230 A$(I)=A$:A(I)=N
240 NEXT
250 FOR I=0 TO 6
260 READ B$
270 B$(I)=B$
280 NEXT
290 FOR I=8 TO 62
300 READ P
310 PEKARE(I)=P
320 NEXT
330 FOR I=63 TO 70:PE(I)=0:NEXT
340 GOSUB650
350 FOR I=49152 TO 49409:READ QQ:TQ=TQ+QQ:POKE I,QQ:NEXT
360 IF TQ<> 25575 THEN PRINT"DATA ERROR":END
370 PRINT"❐ ▚ ▀2▚ ▀3▚ | ▀5▚ ▀6▚ ▀7▚ | ▀9▚ ▀0▚ | ▀-▚ ▀\▚ "
380 PRINT" ▚ ▐▌▐▌ | ▐▌▐▌▐▌ | ▐▌▐▌ | ▐▌▐▌ "
390 PRINT" ▚Q|W|E|R|T|Y|U|I|O|P|@|*|↑"
400 PRINTSPC(28)"▔▔▔VOICE 1"
410 PRINT"▚▚"
420 PRINT" ▚ ▀S▚ ▀D▚ | ▀G▚ ▀H▚ ▀J▚ | ▀L▚ ▀:▚ "
430 PRINT" ▚ ▐▌▐▌ | ▐▌▐▌▐▌ | ▐▌▐▌ "
440 PRINT" ▚Z|X|C|V|B|N|M|,|.|/"
450 PRINTSPC(28)"▔▔▔VOICE 2"
460 PRINT"▚▚"
470 PRINT" ▚FUNCTION█               ▚VOICE 1     VOICE 2▚"
480 PRINT"  1 WAVEFORM"
490 PRINT"  2 LO PULSE"
500 PRINT"  3 HI PULSE"
510 PRINT"  4 ATTACK"
520 PRINT"  5 DECAY"
530 PRINT"  6 SUSTAIN"
540 PRINT"  7 RELEASE"
```

SYNTH

This is a very good keyboard program which allows the user to play notes on the 64's keyboard. With this program, there are two keyboards, the top two rows and the bottom two rows. These can be played independently of each other. This is done with a machine code routine in interrupts which can detect two keys pressed down at any one time.

All of the SID parameters can be changed by first pressing RETURN and then the number of the option.

```
550 PRINT"  8 F RESONANCE"
560 PRINT"  9 L0 FILTER"
570 PRINT" 10 HI FILTER"
580 PRINT" 11 FILTER PASS"
590 PRINT" 12 SPECIAL"
600 GOSUB1850
610 SYS49155
620 FOR I=1 TO 50  :NEXT
630 IF PEEK(197)=1  GOTO820
640 GOTO620
650 FOR I=1 TO 12
660 READ T
670 T=T/2
680 HF%=T/256:LF%=T-256*HF%
690 TT(I+24,1)=HF%:TT(I+24,2)=LF%
700 T=T/2
710 HF%=T/256:LF%=T-256*HF%
720 TT(I+12,1)=HF%:TT(I+12,2)=LF%
730 T=T/2
740 HF%=T/256:LF%=T-256*HF%
750 TT(I,1)=HF%:TT(I,2)=LF%
760 NEXT
770 FORI=0TO63
780 POKE49410+I,TT(PE(I),2)
790 POKE49474+I,TT(PE(I),1)
800 NEXT
810 RETURN
820 PRINT"♥WHICH FUNCTION REQUIRED 0=PLAY"
830 POKE 198,0:SYS49152
840 INPUT FU
850 IF FU=0 THEN PRINT"]    ":PRINT"TT]":PRINT BLANKA$"]":GOTO620
860 IF FU>12 THEN PRINT "]  ,       ":PRINT"TT]":GOTO820
870 IF FU>7 AND FU<13 THEN PRINT"]  FUNCTION " FU:VO=1:SYS 49155:GOTO930
880 PRINT"]QQQQ■■■■WHICH VOICE TO CHANGE":POKE 198,0
890 INPUT "      1 OR 2";VOICE:SYS49155
900 IF VO =1 OR VO=2 GOTO920
910 GOTO880
920 PRINT"]  FUNCTION " FU " VOICE " VO
930 IF FU =11 GOTO1190
940 IF FU =12 GOTO1550
950 IF FU =1  GOTO1410
960 PRINT"QQ  PRESENT SETTING = " FU%(FU,VO)
970 FOR I=1 TO 200:NEXT
980 IF PEEK(197)=1  GOTO370
990 IF PEEK(197)=4  THEN FU%(FU,VO)=FU%(FU,VO)+1:GOTO1020
1000 IF PEEK(197)=5  THEN FU%(FU,VO)=FU%(FU,VO)-1:GOTO1020
1010 GOTO980
1020 IF FU =  2 OR FU = 10 GOTO1160
1030 IF FU = 12 GOTO1410
1040 IF FU =  9 GOTO1820
1050 IF FU%(FU,VO)>15 THEN FU%(FU,VO)=0
1060 IF FU%(FU,VO)<0  THEN FU%(FU,VO)=15
1070 PRINT"]"SPC(20)"             "
1080 PRINT"]"SPC(20)"  " FU%(FU,VO)
1090 POKE 54277+(VO-1)*7,16*FU%(4,VO)+FU%(5,VO)
1100 IF FU=9 THEN POKE 54293,FU%(FU,1)
1110 IF FU=10THEN POKE 54294,FU%(FU,1)
1120 POKE 54278+(VO-1)*7,16*FU%(6,VO)+FU%(7,VO)
1130 POKE 54274+(VO-1)*7,FU%(2,VO)
1140 POKE 54275+(VO-1)*7,FU%(3,VO)
1150 GOTO980
1160 IF FU%(FU,VO)>255THEN FU%(FU,VO)=0
1170 IF FU%(FU,VO)<0  THEN FU%(FU,VO)=255
1180 GOTO1070
1190 PRINT"QQ  PRESENT SETTING = " A$(A)
```

```
1200 FOR I=1 TO 200:NEXT
1210 IF PEEK(197)=1  GOTO1300
1220 IF PEEK(197)=4  THEN A=A+1:GOTO1250
1230 IF PEEK(197)=5  THEN A=A-1:GOTO1250
1240 GOTO1210
1250 IF A>8 THEN A=1:GOTO1270
1260 IF A<0 THEN A=8:GOTO1270
1270 PRINT"]"SPC(20)"             "
1280 PRINT"]"SPC(20)"  " A$(A)
1290 GOTO1210
1300 IF A=1 THEN SF=0:POKE 54295,16*FU%(8,1)+SF:GOTO370
1310 PRINT"QWHICH VOICE TO FILTER"
1320 PRINT"VOICE  1=1    VOICE  2=2     B]DA=3"
1330 PRINT"PRESENT SETTING = "SF
1340 POKE 198,0:SYS 49152:INPUT SF
1350 IF SF> 3  THEN PRINT"]T]":GOTO1340
1360 SYS 49155
1370 POKE 54295,16*FU%(8,1)+SF
1380 POKE 54296,A(A)+15
1390 IF PEEK(197)=1 GOTO370
1400 PRINT"]": GOTO1190
1410 PRINT"QQ  PRESENT SETTING = " B$(B(VO))
1420 FOR I=1 TO 200:NEXT
1430 IF PEEK(197)=1  GOTO370
1440 IF PEEK(197)=4  THEN B(VO)=B(VO)+1:GOTO1470
1450 IF PEEK(197)=5  THEN B(VO)=B(VO)-1:GOTO1470
1460 GOTO1430
1470 IF B(1)<>1 AND C= 5 THEN C=6
1480 IF B(VO)>3 THEN B(VO)=0:GOTO1500
1490 IF B(VO)<0 THEN B(VO)=3:GOTO1500
1500 IF VO=1 THEN POKE 252,16*2↑B(1):IF C=4 THEN POKE 252,PEEK(252)OR2
1510 IF VO=2 THEN POKE 253,16*2↑B(2)
1520 PRINT"]"SPC(20)"             "
1530 PRINT"]"SPC(20)"  " B$(B(VO))
1540 GOTO1430
1550 PRINT"QQ  PRESENT SETTING = " B$(C)
1560 FOR I=1 TO 200:NEXT
1570 IF PEEK(197)=1  GOTO1660
1580 IF PEEK(197)=4  THEN C=C+1:GOTO1610
1590 IF PEEK(197)=5  THEN C=C-1:GOTO1610
1600 GOTO1570
1610 IF C>6 THEN C=4:GOTO1630
1620 IF C<4 THEN C=6
1630 PRINT"]"SPC(20)"             "
1640 PRINT"]"SPC(20)"  " B$(C)
1650 GOTO1560
1660 IF C=6 THEN LF=0:HF=0:POKE 252,PEEK(252)AND240 :GOTO370
1670 POKE 198,0:SYS49152
1680 PRINT "QLO FREQUENCY FOR VOICE 3 (1-255)
1690 PRINT "PRESENT SETTING " LF
1700 INPUT"NEW SETTING";LF
1710 PRINT "QHI FREQUENCY FOR VOICE 3 (1-255)
1720 PRINT "PRESENT SETTING " HF
1730 INPUT"NEW SETTING";HF
1740 IF C=5 THEN B(1)=1
```

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```
1750 IF C=6 GOTO370
1760 POKE 54286,LF
1770 POKE 54287,HF
1780 POKE 54296,A(A)+15
1790 IF C=4 THEN POKE 252,PEEK(252)OR2
1800 IF C=5 THEN POKE 252,21
1810 GOTO370
1820 IF FU%(FU,1)>7  THEN FU%(FU,1)=0
1830 IF FU%(FU,1)<0  THEN FU%(FU,1)=7
1840 GOTO1070
1850 PRINT":TTTTTTTTTTTT"
1860 FOR I=1 TO 11
1870 IF I=1 THEN PRINT,,B$(B(1)),B$(B(2)):GOTO1910
1880 IF I=11THEN PRINT,,A$(A):GOTO1910
1890 IF I>7 THEN PRINT,,"     "FU%(I,1):GOTO1910
1900 PRINT ,,FU%(I,1),FU%(I,2)
1910 NEXT
1920 PRINT ,,B$(C)
1930 RETURN
1940 DATA "            ",0
1950 DATA "LO          ",16
1960 DATA "LO       HI ",80
1970 DATA "LO  BAND    ",48
1980 DATA "LO  BAND HI ",112
1990 DATA "         HI ",64
2000 DATA "    BAND HI ",96
2010 DATA "    BAND    ",32
2020 DATA "TRIANGLE"
2030 DATA "SAWTOOTH"
2040 DATA "PULSE   "
2050 DATA "NOISE   "
2060 DATA "SYNC    "
2070 DATA "RINGMOD "
2080 DATA "        "
2090 DATA 16,15,0,0,1,2,17,0,19,18,4,21,5,0,20,3,23,22,7,0,8
2100 DATA 9,24,6,26,25,11,28,12,0,27,10,0,29,14,31,15,16
2110 DATA 30,13,33,32,0,0,0,0,34,17,0,0,0,14,0,0,13
2120 DATA 34334,36376,38539,40830,43258,45830,48556,51443,54502,57743,61176
2130 DATA 64814
2140 DATA76,16,192,120,169,96,141,20,3,169,192,141,21,3,88,96,120,169,49
2150 DATA141,20,3,169
2160 DATA234,141,21,3,88,96,160,64,132,251,132,254,141,0,220,174,1,220,224
2170 DATA255,240,48,169,254,141,0,220,160,0,162,8,173,1,220,205,1,220,208,246
2180 DATA74,176,14,36,251,112,8,36,254,80,6,132,254,112,2,132,251,200,192
2190 DATA65,176,9,202
2200 DATA208,231,56,46,0,220,208,215,76,66,235,32,102,192,76,49,234,32,29
2210 DATA192,36,251,112,15,165,251,32,155,192,36,254,112,28,165,254,32,155,192
2220 DATA96,32,130,192,76,138,192,165,252,41,254,141,4,212,96,165,253,41
2230 DATA254,141,11,212
2240 DATA96,166,251,189,194,192,240,241,208,231,170,160,7,189,194,192,208
2250 DATA2,160,0,189,66,193,153,1,212,189,2,193,153,0,212,29,66,193,240,11,189
2260 DATA194,192,170,181,252,9,1,153,4,212,96,0,0,0,0,0,0,0,0,0,1,0,1,1,0,0
2270 DATA0,0,1,0,1,1,0,1,0,0,1,0,1,1,0,1,0,0,1,0,1,1,0,1,0,0,1,0,1,1,0,1,0,0,1
2280 DATA0,0,0,0,1,0,0,0,0,0,0,0,0
READY.
```

Basic aid routines

This month, as promised, we have two more Basic aid routines for the 64. These are MERGE and RENUMBER. These are both very useful for writing and tidying up Basic programs.

Before the programs, just a mention about what is left to do for a complete Basic aid.

There is only one routine left to complete for the Basic aid. That routine is CHANGE. When this routine is completed, hopefully by next month, the full Basic aid will be re-published as one program.

Some may wonder why everything has to be published again. The answer is that in the final version, you can forget all of the SYS calls as they will be replaced with actual Basic commands. More of that when it appears.

The other thing to mention about the final version is that there are a couple of commands that have not been published. These are to control the function keys using a modification of December's 16 function keys routine.

MERGE

This program merges a Basic program stored on disk only. If program lines conflict, the merged line will overwrite the original.

To call this routine, enter:
SYS50289"filename",d

Where d is the device number of the disk drive (normally 8 but can be changed).

```
10 I=50289:T=0
20 READA:IFA=-1THEN50
30 POKEI,A:I=I+1
40 T=T+A:GOTO20
50 IFT<>24729THENPRINT"▒▒CHECKSUM ERROR":END
60 IFI<>50505THENPRINT"▒▒NUMBER OF DATA VALUES ERROR":END
70 PRINT"▒▒▒▒USE SYS(50289)"CHR$(34)"FILENAME"CHR$(34)",8"
80 PRINT"▒TO MERGE FILENAME FROM DISK"
90 END
100 DATA32,212,225,165,186,201,1
110 DATA208,5,162,9,76,55,164
120 DATA169,52,160,197,32,30,171
130 DATA32,193,245,169,14,32,28
140 DATA197,133,184,141,51,197,169
150 DATA0,133,185,32,192,255,174
160 DATA51,197,32,198,255,169,27
170 DATA141,44,3,169,197,141,45
180 DATA3,169,248,141,2,3,169
190 DATA196,141,3,3,32,207,255
200 DATA32,207,255,32,207,255,133
210 DATA20,32,207,255,133,21,5
220 DATA20,240,51,165,144,208,47
230 DATA32,207,255,133,20,32,207
240 DATA255,133,21,160,0,32,207
250 DATA255,153,0,2,166,197,224
260 DATA63,240,23,200,201,0,208
270 DATA239,152,24,105,4,133,11
280 DATA165,144,208,8,164,11,76
290 DATA164,164,76,186,196,169,131
300 DATA141,2,3,169,164,141,3
310 DATA3,169,47,141,44,3,169
320 DATA243,141,45,3,173,51,197
330 DATA32,195,255,32,204,255,76
340 DATA116,164,96,166,152,224,0
350 DATA240,16,221,88,2,208,6
360 DATA56,233,1,76,28,197,202
370 DATA240,2,208,240,96,0,145
380 DATA32,32,32,32,32,20,20
390 DATA20,20,20,77,69,82,71
400 DATA73,78,71,58,32,0,-1
READY.
```

```
C471  20D4E1   JSR  $E1D4
C474  A5BA     LDA  $BA
C476  C901     CMP  #$01
C478  D005     BNE  $C47F
C47A  A209     LDX  #$09
C47C  4C37A4   JMP  $A437
C47F  A934     LDA  #$34
C481  A0C5     LDY  #$C5
C483  201EAB   JSR  $AB1E
C486  20C1F5   JSR  $F5C1
C489  A90E     LDA  #$0E
C48B  201CC5   JSR  $C51C
C48E  85B8     STA  $B8
C490  8D33C5   STA  $C533
C493  A900     LDA  #$00
C495  85B9     STA  $B9
C497  20C0FF   JSR  $FFC0
C49A  AE33C5   LDX  $C533
C49D  20C6FF   JSR  $FFC6
C4A0  A91B     LDA  #$1B
C4A2  8D2C03   STA  $032C
C4A5  A9C5     LDA  #$C5
C4A7  8D2D03   STA  $032D
C4AA  A9F8     LDA  #$F8
C4AC  8D0203   STA  $0302
C4AF  A9C4     LDA  #$C4
C4B1  8D0303   STA  $0303
C4B4  20CFFF   JSR  $FFCF
C4B7  20CFFF   JSR  $FFCF
C4BA  20CFFF   JSR  $FFCF
C4BD  8514     STA  $14
C4BF  20CFFF   JSR  $FFCF
C4C2  8515     STA  $15
C4C4  0514     ORA  $14
C4C6  F033     BEQ  $C4FB
C4C8  A590     LDA  $90
C4CA  D02F     BNE  $C4FB
C4CC  20CFFF   JSR  $FFCF
C4CF  8514     STA  $14
C4D1  20CFFF   JSR  $FFCF
C4D4  8515     STA  $15
C4D6  A000     LDY  #$00
C4D8  20CFFF   JSR  $FFCF
C4DB  990002   STA  $0200,Y
C4DE  A6C5     LDX  $C5
C4E0  E03F     CPX  #$3F
C4E2  F017     BEQ  $C4FB
C4E4  C8       INY
C4E5  C900     CMP  #$00
C4E7  D0EF     BNE  $C4D8
C4E9  98       TYA
C4EA  18       CLC
C4EB  6904     ADC  #$04
C4ED  850B     STA  $0B
C4EF  A590     LDA  $90
C4F1  D008     BNE  $C4FB
C4F3  A40B     LDY  $0B
C4F5  4CA4A4   JMP  $A4A4
C4F8  4CBAC4   JMP  $C4BA
C4FB  A983     LDA  #$83
C4FD  8D0203   STA  $0302
C500  A9A4     LDA  #$A4
C502  8D0303   STA  $0303
C505  A92F     LDA  #$2F
C507  8D2C03   STA  $032C
C50A  A9F3     LDA  #$F3
C50C  8D2D03   STA  $032D
C50F  AD33C5   LDA  $C533
C512  20C3FF   JSR  $FFC3
C515  20CCFF   JSR  $FFCC
C518  4C74A4   JMP  $A474
C51B  60       RTS
C51C  A698     LDX  $98
C51E  E000     CPX  #$00
C520  F010     BEQ  $C532
C522  DD5802   CMP  $0258,X
C525  D006     BNE  $C52D
C527  38       SEC
C528  E901     SBC  #$01
C52A  4C1CC5   JMP  $C51C
C52D  CA       DEX
C52E  F002     BEQ  $C532
C530  D0F0     BNE  $C522
C532  60       RTS
C533  00       BRK
C534  9120     STA  ($20),Y
C536  202020   JSR  $2020
C539  201414   JSR  $1414
C53C  14       BYT  $14
C53D  14       BYT  $14
C53E  14       BYT  $14
C53F  4D4552   EOR  $5245
C542  47       BYT  $47
C543  494E     EOR  #$4E
C545  47       BYT  $47
C546  3A       BYT  $3A
C547  200020   JSR  $2000
READY.
```

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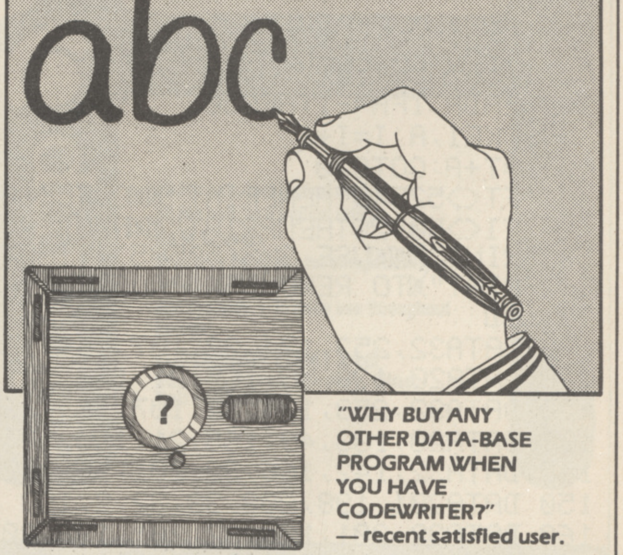

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RENUMBER

There have been a lot of people inquiring as to whether we have a renumber routine for the 64. For those who did, here it is. For those who didn't or don't know what a renumber routine is meant to do, read on.

A renumber routine will modify the program by changing the line numbers to be in equal steps. This is good for making it presentable when complete or making room to enter more lines.

The routine is called by:
SYS50505,start,step

Where start is the start line number for the renumbered program and step is the line increment.

As well as the line numbers being altered, all GOTOs, GOSUBs, THENs, and RUNs will have the value following them changed to point to the new line numbers. The only command that refers to line numbers that is not changed is the LIST command. The reason for ignoring that command is because of the complicated range facilities.

Any jump to a non-existent line number will be replaced with 65535 (which is an illegal line number and so can be found easily).

```
10 I=50505:T=0
20 READA:IFA=-1THEN50
30 POKEI,A:I=I+1
40 T=T+A:GOTO20
50 IFT<>52549THENPRINT"██CHECKSUM ERROR":END
60 IFI<>50928THENPRINT"██NUMBER OF VALUES ERROR":END
70 PRINT"███USE SYS(50505),START,STEP"
80 PRINT"█TO RENUMBER PROGRAM"
90 END
100 DATA32,253,174,32,107,169,165
110 DATA20,133,53,165,21,133,54
120 DATA32,253,174,32,107,169,165
130 DATA20,133,49,165,21,133,50
140 DATA32,142,166,32,201,198,32
150 DATA201,198,208,33,32,2,198
160 DATA32,201,198,32,201,198,208
170 DATA3,76,212,198,32,201,198
180 DATA165,99,145,122,32,201,198
190 DATA165,98,145,122,32,13,198
200 DATA240,226,32,201,198,32,201
210 DATA198,32,201,198,201,34,208
220 DATA11,32,201,198,240,197,201
230 DATA34,208,247,240,238,170,240
240 DATA188,16,233,162,4,221,235
250 DATA198,240,5,202,208,248,240
260 DATA221,165,122,133,59,165,123
270 DATA133,60,32,115,0,176,211
280 DATA32,107,169,32,32,198,165
290 DATA60,133,123,165,59,133,122
300 DATA160,0,162,0,189,0,1
310 DATA240,17,72,32,115,0,144
320 DATA3,32,82,198,104,160,0
330 DATA145,122,232,208,234,32,115
340 DATA0,176,8,32,97,198,32
350 DATA121,0,144,248,201,44,240
360 DATA186,208,152,165,53,133,99
370 DATA165,54,133,98,76,142,166
380 DATA165,99,24,101,49,133,99
390 DATA165,98,101,50,133,98,32
400 DATA201,198,208,251,96,32,2
410 DATA198,32,201,198,32,201,198
420 DATA208,8,169,255,133,99,133
430 DATA98,48,14;32,201,198,197
440 DATA20,208,16,32,201,198,197
450 DATA21,208,12,162,144,56,32
460 DATA73,188,76,223,189,32,201
470 DATA198,32,13,198,240,209,32
480 DATA114,198,230,251,32,165,198
490 DATA230,45,208,2,230,46,96
500 DATA32,114,198,198,251,32,141
510 DATA198,165,45,208,2,198,46
520 DATA198,45,96,32,124,198,160
530 DATA0,132,17,132,251,96,165
540 DATA122,133,34,165,123,133,35
550 DATA165,45,133,36,165,46,133
560 DATA37,96,164,17,200,177,34
570 DATA164,251,200,145,34,32,190
580 DATA198,208,1,96,230,34,208
590 DATA236,230,35,208,232,164,17
600 DATA177,36,164,251,145,36,32
610 DATA190,198,208,1,96,165,36
620 DATA208,2,198,37,198,36,76
630 DATA165,198,165,34,197,36,208
640 DATA4,165,35,197,37,96,160
650 DATA0,230,122,208,2,230,123
660 DATA177,122,96,32,51,165,165
670 DATA34,166,35,24,105,2,133
680 DATA45,144,1,232,134,46,32
690 DATA89,166,76,116,164,0,137
700 DATA138,141,167,-1
READY.
```

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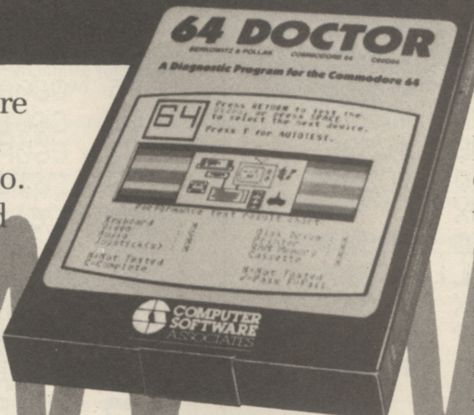
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64
Press RETURN to test the device, or press SPACE to select the next device.
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```
C549   20FDAE    JSR  $AEFD
C54C   206BA9    JSR  $A96B
C54F   A514      LDA  $14
C551   8535      STA  $35
C553   A515      LDA  $15
C555   8536      STA  $36
C557   20FDAE    JSR  $AEFD
C55A   206BA9    JSR  $A96B
C55D   A514      LDA  $14
C55F   8531      STA  $31
C561   A515      LDA  $15
C563   8532      STA  $32
C565   208EA6    JSR  $A68E
C568   20C9C6    JSR  $C6C9
C56B   20C9C6    JSR  $C6C9
C56E   D021      BNE  $C591
C570   2002C6    JSR  $C602
C573   20C9C6    JSR  $C6C9
C576   20C9C6    JSR  $C6C9
C579   D003      BNE  $C57E
C57B   4CD4C6    JMP  $C6D4
C57E   20C9C6    JSR  $C6C9
C581   A563      LDA  $63
C583   917A      STA  ($7A),Y
C585   20C9C6    JSR  $C6C9
C588   A562      LDA  $62
C58A   917A      STA  ($7A),Y
C58C   200DC6    JSR  $C60D
C58F   F0E2      BEQ  $C573
C591   20C9C6    JSR  $C6C9
C594   20C9C6    JSR  $C6C9
C597   20C9C6    JSR  $C6C9
C59A   C922      CMP  #$22
C59C   D00B      BNE  $C5A9
C59E   20C9C6    JSR  $C6C9
C5A1   F0C5      BEQ  $C568
C5A3   C922      CMP  #$22
C5A5   D0F7      BNE  $C59E
C5A7   F0EE      BEQ  $C597
C5A9   AA        TAX
C5AA   F0BC      BEQ  $C568
C5AC   10E9      BPL  $C597
C5AE   A204      LDX  #$04
C5B0   DDEBC6    CMP  $C6EB,X
C5B3   F005      BEQ  $C5BA
C5B5   CA        DEX
C5B6   D0F8      BNE  $C5B0
C5B8   F0DD      BEQ  $C597
C5BA   A57A      LDA  $7A
C5BC   853B      STA  $3B
```

```
C5BE   A57B      LDA  $7B
C5C0   853C      STA  $3C
C5C2   207300    JSR  $0073
C5C5   B0D3      BCS  $C59A
C5C7   206BA9    JSR  $A96B
C5CA   2020C6    JSR  $C620
C5CD   A53C      LDA  $3C
C5CF   857B      STA  $7B
C5D1   A53B      LDA  $3B
C5D3   857A      STA  $7A
C5D5   A000      LDY  #$00
C5D7   A200      LDX  #$00
C5D9   BD0001    LDA  $0100,X
C5DC   F011      BEQ  $C5EF
C5DE   48        PHA
C5DF   207300    JSR  $0073
C5E2   9003      BCC  $C5E7
C5E4   2052C6    JSR  $C652
C5E7   68        PLA
C5E8   A000      LDY  #$00
C5EA   917A      STA  ($7A),Y
C5EC   E8        INX
C5ED   D0EA      BNE  $C5D9
C5EF   207300    JSR  $0073
C5F2   B008      BCS  $C5FC
C5F4   2061C6    JSR  $C661
C5F7   207900    JSR  $0079
C5FA   90F8      BCC  $C5F4
C5FC   C92C      CMP  #$2C
C5FE   F0BA      BEQ  $C5BA
C600   D098      BNE  $C59A
C602   A535      LDA  $35
C604   8563      STA  $63
C606   A536      LDA  $36
C608   8562      STA  $62
C60A   4C8EA6    JMP  $A68E
C60D   A563      LDA  $63
C60F   18        CLC
C610   6531      ADC  $31
C612   8563      STA  $63
C614   A562      LDA  $62
C616   6532      ADC  $32
C618   8562      STA  $62
C61A   20C9C6    JSR  $C6C9
C61D   D0FB      BNE  $C61A
C61F   60        RTS
C620   2002C6    JSR  $C602
C623   20C9C6    JSR  $C6C9
C626   20C9C6    JSR  $C6C9
C629   D008      BNE  $C633
```

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106  C638  D010    BNE  $C64A
107  C63A  20C9C6  JSR  $C6C9
108  C63D  C515    CMP  $15
109  C63F  D00C    BNE  $C64D
110  C641  A290    LDX  #$90
111  C643  38      SEC
112  C644  2049BC  JSR  $BC49
113  C647  4CDFBD  JMP  $BDDF
114  C64A  20C9C6  JSR  $C6C9
115  C64D  200DC6  JSR  $C60D
116  C650  F0D1    BEQ  $C623
117  C652  2072C6  JSR  $C672
118  C655  E6FB    INC  $FB
119  C657  20A5C6  JSR  $C6A5
120  C65A  E62D    INC  $2D
121  C65C  D002    BNE  $C660
122  C65E  E62E    INC  $2E
123  C660  60      RTS
124  C661  2072C6  JSR  $C672
125  C664  C6FB    DEC  $FB
126  C666  208DC6  JSR  $C68D
127  C669  A52D    LDA  $2D
128  C66B  D002    BNE  $C66F
129  C66D  C62E    DEC  $2E
130  C66F  C62D    DEC  $2D
131  C671  60      RTS
132  C672  207CC6  JSR  $C67C
133  C675  A000    LDY  #$00
134  C677  8411    STY  $11
135  C679  84FB    STY  $FB
136  C67B  60      RTS
137  C67C  A57A    LDA  $7A
138  C67E  8522    STA  $22
139  C680  A57B    LDA  $7B
140  C682  8523    STA  $23
141  C684  A52D    LDA  $2D
142  C686  8524    STA  $24
143  C688  A52E    LDA  $2E
144  C68A  8525    STA  $25
145  C68C  60      RTS
146  C68D  A411    LDY  $11
147  C68F  C8      INY
148  C690  B122    LDA  ($22),Y
149  C692  A4FB    LDY  $FB
150  C694  C8      INY
151  C695  9122    STA  ($22),Y
152  C697  20BEC6  JSR  $C6BE
153  C69A  D001    BNE  $C69D
154  C69C  60      RTS
155  C69D  E622    INC  $22
156  C69F  D0EC    BNE  $C68D
157  C6A1  E623    INC  $23
158  C6A3  D0E8    BNE  $C68D
159  C6A5  A411    LDY  $11
160  C6A7  B124    LDA  ($24),Y
161  C6A9  A4FB    LDY  $FB
162  C6AB  9124    STA  ($24),Y
163  C6AD  20BEC6  JSR  $C6BE
164  C6B0  D001    BNE  $C6B3
165  C6B2  60      RTS
166  C6B3  A524    LDA  $24
167  C6B5  D002    BNE  $C6B9
168  C6B7  C625    DEC  $25
169  C6B9  C624    DEC  $24
170  C6BB  4CA5C6  JMP  $C6A5
171  C6BE  A522    LDA  $22
172  C6C0  C524    CMP  $24
173  C6C2  D004    BNE  $C6C8
174  C6C4  A523    LDA  $23
175  C6C6  C525    CMP  $25
176  C6C8  60      RTS
177  C6C9  A000    LDY  #$00
178  C6CB  E67A    INC  $7A
179  C6CD  D002    BNE  $C6D1
180  C6CF  E67B    INC  $7B
181  C6D1  B17A    LDA  ($7A),Y
182  C6D3  60      RTS
183  C6D4  2033A5  JSR  $A533
184  C6D7  A522    LDA  $22
185  C6D9  A623    LDX  $23
186  C6DB  18      CLC
187  C6DC  6902    ADC  #$02
188  C6DE  852D    STA  $2D
189  C6E0  9001    BCC  $C6E3
190  C6E2  E8      INX
191  C6E3  862E    STX  $2E
192  C6E5  2059A6  JSR  $A659
193  C6E8  4C74A4  JMP  $A474
194  C6EB  00      BRK
195  C6EC  89      BYT  $89
196  C6ED  8A      TXA
197  C6EE  8DA77F  STA  $7FA7

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You might think you would have to pay more for a 10 + 10 storage unit with so much going for it. You'd be wrong. Surprisingly, the Alpha 10 is one of the lowest price 20 Mbyte disk cartridge systems you will find.

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London area distributor:
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London WC1 3AE.
Tel: 01-631 3253, Telex: 23586.

APS MICROSYSTEMS LTD

Unit 5, Victoria Road Trading Estate,
Portslade, Brighton, Sussex.
Tel: (0273) 422512 Telex 87351.

PC-DOS is a trademark of IBM, MS-DOS is a trademark of Microsoft Corporation and CP/M-86 is a trademark of Digital Research Inc.

'How to'

Hutchinson Publishing Group are moving into the area of business microcomputer software training. The first products to support the move will be Sound Training audio teaching packs.

These will consist of two audio tapes, a reference guide and a checklist and will retail at £39.95. Titles include 'How to use Visicalc', with a number of others under development.

Contact: Hutchinson Publishing Group, Hutchinson House, 17-21 Conway Street, London W1P 6JD. Tel: 01-387 2811.

Screen

Keep your screen clean with the Screen Safe Kit from Pelling + Cross. It costs £8.70 and consists of a cleaning spray, a wallet with optical grade and fluff free wiping tissue and a small high pressure "Dust Off" aerosol which blows dust off the screen.

Intended for coated and uncoated screens, it will also clean peripheral equipment such as printers. Mail order price for the kit is £11.73.

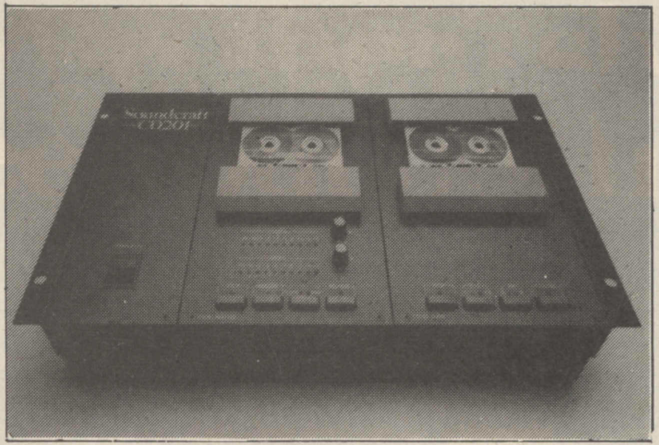
Contact: Pelling + Cross Ltd, 104 Baker Street, London W1. Tel: 01-487 5411.

Grappler

Orange Micro have launched the Grappler CD, an intelligent printer interface for the 64 retailing at £109.

Over 20 commands are accessible either from keyboard or software and by using the grappler, Orange Micro claim that your printer will be compatible with most Commodore Software. Features include three modes of operation, character translations of program listings, screen dumping and full control over text and hi-res graphic screens.

Contact: P & P Micro Distributors Ltd, 1 Gleneagles Road, London SW16 6AY. Tel: 01-677 7631.



Duplicate at speed

Sound Electronics have launched the Soundcraft CD 201, a high speed cassette duplicator. It costs £1,290.

Businesses using the 64 might find the duplicator invaluable for distributing promotional programs or recording business meetings. By adding slaves to the master module more cassettes can be duplicated.

Contact: Soundcraft Electronics Ltd, 5-8 Great Sutton Street, London EC1 0BX. Tel: 01-253 6988.

ACOS + utility

Melbourne House claim that ACOS+, their new utility program, will make the 64 datasette as convenient as a disk drive.

ACOS+ retails at £8.95. It enables some features of the 64 normally only accessible using machine code or by complex PEEKing and POKEing to be available to anyone.

Features include a collection of 36 advanced Basic commands, fast cassette operation, simplified sprite movement, sprite collision detection, range of sound and utility commands and it also allows the user to add further Basic commands. Zorn, a game program, uses the ACOS+ commands to demonstrate the power and speed that can be obtained using the Basic commands.

Contact: Melbourne House, Castle Yard House, Castle Yard, Richmond TW10 6TF. Tel: 01 940 6064.

Platinum

Norman Magnetics recently launched the Platinum range – a collection including 5.25 disks. A variety of disk forms are available – single, double or quad density, single or double sided and hard or soft sectored.

Prices vary – ten single sided double density disks cost £14 whereas ten double sided quad density disks retail at £27.

Contact: Norman Magnetics Ltd, Invincible Road, Farnborough, Hampshire GU14 7NP. Tel: 0252 515066.

Revamp

Doublemode, a Scottish Electronics Company, are converting ex-rental television sets into visual display units.

The Doublemode VDU offers higher specifications than a purpose made VDU because of its base apparatus and retails at £85 + VAT.

It comes with 20, 22 or 26 inch screens and is suitable for either the VIC-20 or the 64.

Contact: Information Centre, Doublemode Ltd, 121 High Street, Irvine KA12 8AA, Scotland. Tel: 0294 2431.

Audio aid

Future Copies of Precision's Superbase 64 will be accompanied by an audio learning cassette. By listening to the cassette, the user does not have to constantly leaf through the manual.

Bruce Hunt of Precision believes that "the cassette offers an enjoyable and highly efficient way to get the best out of Superbase 64."

Superbase owners can buy the cassette for £7.

Contact: Consumer Products Division, Precision Software, 6 Park Terrace, Worcester Park, Surrey KT4 7JZ. Tel: 01-330 7166.

Alpha 10

APS Microsystems are launching the Alpha 10 hard disk at the Commodore Show in June. Compatible with both the 8000 and 700 series it costs £3,600 including all the necessary hardware and software.

The Alpha 10 hard disk has a 20 megabyte memory capacity and is based on a removable cartridge storing system.

Contact: APS Microsystems, Unit 5, Victoria Road Trading Estate, Portslade, Brighton, Sussex. Tel: 0273 422512.

Reeler

The Reeler, with its 40 foot length of 75-ohm co-axial cable, will enable a 64 or VIC-20 user to use the computer from a distance more than the usual three feet away from the television.

Businessmen using co-axial cables to drive their monitors will be able to place monitors further apart than normal cables would allow.

The cable winds into a plastic casing and has a carrying handle with integral socket and moulded plug. It costs £7.95.

Contact: Pullway Ltd, Venn House, 11 Clayton Road, Hayes, Middlesex. Tel: 01-848 7747.

Word perfect 64

Rather than pay out for a dedicated word processor many individuals and businesses are turning to home micros. With its large memory, good keyboard and excellent built-in editing facilities the Commodore 64 is ideally suited to the task. Over the next two months we will be looking at some of the word processing software available.

The Commodore 64 is being used more and more as a business machine. Even in companies which use larger mini or even mainframe computers, the 64 is finding a place as a 'workhorse' for all those jobs where the bigger machine is unnecessary or unavailable.

More small businesses and more self employed individuals are turning to personal computers that have a little versatility such as the 64.

In all these cases it's highly likely that work processing will be at the top of the list of applications. Unfortunately, it's not easy to choose a word processor. There are several excellent packages on the market and most have their advocates. It would be a foolish reviewer who stuck his or her neck out and recommended one above all others for all users.

Some word processing packages will undoubtedly suit some users more than others. And the choice of package may depend on existing software. If you already have a database management system, a filing system or some other piece of business software it would probably be a good idea to buy a word processor that's compatible.

It may seem ironic to suggest that buying a cheaper word processor may be a mistake especially if you may not be using a word processor very much, but a cheaper package may actually be more difficult to use than a more expensive package. But the more you use it the more familiar you will become with it and the easier it will be to use!

Just because you do not intend to use a word processor a great deal don't be tempted into buying a cheaper package simply because it is cheaper. It may turn out to be more difficult to learn to use and if you're not going to be using it very much then it will take you a long time to familiarise yourself with it. This is quite likely to lead to frustration and disillusionment.

In fact, ease of use is probably the single most important criterion to consider when buying a word processor. You will need to consider carefully the four main functions of a word processor – writing, storage and retrieval, editing and printing. It is likely that all four will assume equal importance but there may be one aspect of the word processor that interests you most.

Print format, for instance, if you are in a business where imaginative presentation of written material is important. Or there may be aspects of data storage and retrieval that are more important. Here you will need to look at facilities such as merging files and adding to files.

One of the biggest problems facing the reviewer of word processors for the 64 is the knowledge that most of them are capable of carrying out the same range of functions.

Word processors on the 64 take up comparatively little memory because many of the editing facilities required in word processing are actually built in to the 64. Originally this was intended to make life easier for programmers but it's proved a special boon for word processor programmers.

Even without a word processor you can move the cursor where you like on the screen, one keypress takes it home to the top left corner of the screen and you can insert and delete copy. As long as you possess a printer the 64 is already a primitive sort of word processor.

Most word processors work satisfactorily with a wide range of printers and give you enough freedom to exploit the printer to the full. Indeed, in some cases the software may actually be more 'powerful' than the printer.

It's important to remember that you will not be buying a word processor in isolation. If you're reasonably serious about using the computer for business you will possess a disk drive along with your 64. But if you've only just started you may not have a printer.

In that case it's probably a good idea to buy the word processor and printer together. A decent word processor requires a decent printer. It's no real use forking out for the best software if you only intend using a cheap, and therefore limited, printer.

The most important differences between word processor packages are not what they do but how they do it. Leaving aside price, your final decision may rest on something as apparently trivial as the way the cursor moves around the screen.

In fact this is not trivial at all. When you're running through copy to edit it a cursor that moves smoothly and logically is ideal. The most logical way of moving the cursor is by using the cursor keys in exactly the same way as they normally work on the 64. It is therefore slightly disconcerting when you discover that a word processor such as Simplywrite doesn't work that way. 'Cursor up' or 'cursor down' cause the cursor to jump to the beginning of the next or the previous line. Keeping the 'cursor left' or 'cursor right' keys pressed down moves the cursor around quickly but causes it to jump five characters at a time.

All these word processors work on a 40 column screen. Most allow you to use the screen as a window on to a much larger area of text. What many word processor program writers seem to think is that it's vitally important that the text is fully formatted as you type. In this way the text appears almost as it will appear when it's printed. Admittedly many people might prefer not to see words broken arbitrarily – Easyscript and Wordpro, for instance, type right up to the right hand margin and the break comes at the 40th character even if it's in the middle of a word. This is called wrap

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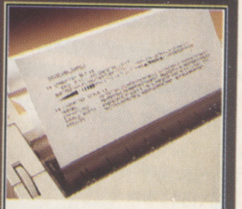

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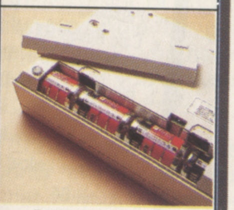

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The HR-5 also has something of an artistic bent.

Being capable of producing uni-directional graphics and charts together with bi-directional text.

It will also hone down characters into a condensed face, or extend them for added emphasis.

Incorporating either a Centronics parallel or RS-232C interface, the HR-5 is compatible with BBC, Spectrum, Oric, Dragon, Atari and most other computers with these interface options.

Perfectly portable, the battery or mains operated HR-5 weighs less than 4lbs, and has a starting price of only £159.95.(inc.VAT).

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	Quickshot joystick II	£10.50
	Intro to Basic (part 1)	£14.50
	Programmers reference guide	£9.95
	Speech Synthesiser	£49.50
	Microguide	£5.95
b	Superbase 64	£99.95
c	Petspeed	£50.00
c	Calc Result SX64	£99.00
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c	Easy Programming for 64	£6.95
c	Commodore 64 Machine Code Master	£6.95
c	Commodore 64 Adventures	£5.95
c	Commodore 64 — Getting the most from it (Tim Onosko)	£7.95
c	Commodore 64 User's Guide	£11.00
c	Computer Playground Commodore 64/Vic 20	£12.70

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Juki Daisy Wheel	£415.95
BBC to Centronics cable	£11.95
64/VIC to Centronics cable	£19.95
Software for above	£7.95

MONITORS

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Commodore 1701 Colour and Sound	£195.95
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BMC 12" Green screen	£113.85
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Phillips Green screen	£79.00
Fidelity RGB, RGBY, Composite and Sound	£228.85

MEDIA SUPPLIES

Diskettes by Verbatim (supplied in boxes of 10)

S.S./D.D. 40Tr	£17.95	D.S./D.D. 80Tr	£32.75
S.S./D.D. 80Tr	£24.75	Plastic library case	£1.35

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around and sounds very disconcerting but it is surprising how quickly you get used to it.

Other word processors – Vizawrite, for instance, use a technique which breaks the line at the nearest complete word below 40 characters. This is easier to read but leaves a ragged right edge (corrected in printing) and the behaviour of the text as the computer looks for the appropriate space can at first be confusing.

If you intend going into word processing in a big way it's a good idea to go for a cartridge rather than a disk. Although there are programs available on tape – in the UK Bubble Bus, of Tonbridge in Kent, produce a letter writing program – it is, of course, out of the question for serious word processing. This is because word processor programs on tape take such a long time to load, sometimes more than 15 minutes. A program on cartridge is, of course, immediately available.

Possibly the most important function of a word processor is to produce a hard copy of your words. It is therefore absolutely essential that your software can support your printer. This is one area where you should be very careful. Some word processing packages claim that they support a wide range of printers but experience does not always bear this out. Unfortunately, we have been unable to test such a wide range of software on such a wide range of hardware!

There are more advanced aspects of processors which most businesses are certain to be using at one time or another. Merge and fill, for instance, are special functions available with most word processors. They would enable you to produce personalised standard letters – the same letter but with certain details changed.

Other facilities include Search which enables you to look through text for certain words or phrases. Replace enables you to replace a word or phrase which occurs anywhere in the text with another word or phrase. Using a word processor, for instance, '64' could be replaced wherever it appears in this article with 'PET'.

Unfortunately, it is not possible to examine every detail of all the word processors we're looking at. We have looked at a number of word processors and have offered a few observations about each one. Even experienced users of word processors can take several months to explore a package fully. We can only give you a rough idea of what each word processor is like. There's no substitute for hands on experience.

The choice of word processor is a personal one. It may well depend on what you're used to. Certainly, switching from one package to another can cause great confusion and can even lead to disasters! No matter how technically sophisticated or simple a program what really matters is how comfortable you feel with it.

Easy Script

Writing: ***** One of the best things about Easy Script is the fact that you can load it and then type straight away. There's no need to worry about format till later. This sort of package is ideal for producing huge chunks of copy.

Editing: **** Could easily have given this aspect of Easy Script five stars but for the Erase command. Press F1 (the control key) followed by EA and everything is erased! If you've just written 5,000 words and you press F1 intending to Insert copy but forget to press I and then start to type the word Easy Script you'll watch helpless and horrified as all your copy disappears from the screen!

Information storage and retrieval: **** One good point about Easy Script is the ease with which you can switch into disk mode to read the disk directory. If you want to replace a file on disk with an amended file in the computer's memory you just hit F1, F. But if you happen to hit F1, L the old file is loaded and if your cursor is at the beginning of your text then wave bye-bye to your amended file!

Printing: **** Elementary printing commands are so easy that even an idiot could print something straight away. But because it doesn't format the text as you type, producing complicated documents is sometimes awkward. You may find yourself switching back and forth between 'output to video' which shows you what the printed text will look like and edit mode to make changes.

Documentation: ***** There are two parts to the manual, a training section and a reference section. Experienced word processing people can glance at the training manual while using the reference section.

General Comments: Given away with the 1541 disk drive so very widely used. Even though Easy Script is not menu driven it is easy to use. If you are looking for your first word processor this is an ideal introduction to the world of word processing.

Vizawrite

Writing: ***** Not quite as easy to start off with as Easy Script because it must be on format first. Usually this means simply setting the margins. But why didn't they default to 40 columns instead of 74 if no choice is made? Uses wordwrap and you must indicate the end of each page yourself.

Editing: ***** Again, the cost of that extra bit of sophistication is simplicity but that is inevitable. There's really nothing that even the office junior couldn't handle.

Information storage and retrieval: ***** Stores information in files as you would expect but the information in the files is stored in pages, 999 pages on each disk so there's a lot of capacity. Directory easily accessible by going back to the menu. But do you have to save or lose everything you've written every time you quit to the menu?

Printing: ***** Really couldn't be easier because it prints exactly as you've written it. In that way it behaves very much like a typewriter.

Documentation: ***** Excellent because although it doesn't assume you know too much neither does it treat you like an idiot. Gets to the nitty gritty quicker than other manuals but is that because the program is menu driven and therefore easier to follow?

General Comments: The personal favourite of this reviewer in front of Easy Script. A writer in a national newspaper recently hammered Easy Script and went into ecstasies over Vizawrite. Which just goes to show that word processors are largely a matter of personal taste. If someone threatened to shoot me unless I recommended one or the other I'd probably say that Easy Script is a better package for hacks who are more interested in churning out large chunks of copy rather than how nice it looks on the page. Vizawrite on the other hand is probably better if you need to produce good looking documents.

COMMODORE 64

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64 pulls its weight

Down in Cambridge, the CBM 64 is helping Chivers/Hartley out of a sticky situation. A computerised system is being set up to speed up the task of ensuring that every jar of jam which comes off the production line complies with the Average Weights Legislation, saving both time and money

Chivers Hartley, like all food manufacturers, have to comply with the Average Weights Legislation and meet criteria set by the Trading Standards Office. The legislation says that food manufacturers must set a target weight for their product to ensure that every product contains the legal amount. This legal obligation necessitates the menial tasks of weighing, recording weights and constructing charts.

When the legislation was first introduced, Chivers Hartley decided not to go along the automatic route. They felt that they could achieve the same results using their manual system. Since then the workload of the quantity control team has increased and the company decided that computerisation was the way to speed up operations.

An IBM mainframe computer is in operation at the Chivers Hartley Cambridge factory, but it would not have been economical to tie it up purely on weight control. Therefore an additional system was necessary. After much searching, they decided that the Commodore 64 was ideal for their requirements.

Available programs for a purpose-built system cost in the region of £2,000 and although they met the requirements of the legislation, no extra facilities were offered. As the programs were stored in ROM they couldn't be altered.

The only answer was to come up with a program written to their requirements.

Computers are already being used within the Cadbury Schweppes organisation of which Chivers Hartley is a part. Ian Millard, responsible for packaging configurations but also a computer hobbyist, visited the group's Summerdale factory where PETs are being used with a tailor-made program.

Being a 64 owner himself, Millard felt the limitations of the PETs memory could be overcome using the 64. The Summerdale program could not be adapted so Ian Millard and Ian Bramford, Chivers Hartley's resident computer expert, wrote their own program from scratch. Developing the program to their specific requirements took just three months, using Basic programming and Machine Code to give high-speed hi-res graphics for the charts.

The system comprises a 64, monitor, single disk-drive and a printer.

Every product manufactured by Chivers Hartley has a computer stock number which is held on the IBM mainframe. The program identifies each product by this number.

Once every 15 minutes four empty jam jars from each of the two production lines are pre-weighed on scales linked to the 64. These are then marked and passed through the filler. They are then picked up at the other end and weighed again.

The computer takes the nominal weight from the stock in the program and calculates the target weight. When calculating the average weight, it is permissible to drop below the nominal weight line as long as the number of jars under the average weight matches the number above within any one hour.

Using the computer, any weight anomalies can be spotted immediately and the production line shut down or adjusted accordingly. Originally an audible alarm was written into the program in the form of a police siren, but this was withdrawn following complaints from the girls in charge of quantity control.

This process goes on throughout the day and at night when there are night shifts in operation.

Up to 17 days of records can be stored on one side of a disk covering both day and night shifts. These records are kept for one year and then they can be scratched and the disk used again. The 64 is ideal for the charts which are not an essential function of the program but an invaluable aid.

If Chivers Hartley receive a complaint or have a spot check by the Trading Standards Office, the relevant information can be quickly retrieved and printed out. The accuracy of the program allows Chivers Hartley to track each jar down to the time it rolled off the production line.

Once the first system is installed and running satisfactorily, Chivers Hartley plan to install further systems on their other production lines which manufacture mincemeat and jelly (which has to be weighed both hot and cold) and also an extra system which will be set aside for program development.

The entire system has cost Chivers Hartley under £1,000 and they expect to recover their costs in just three weeks. Once running, they expect the system to save them thousands of pounds in terms of energy saved if the production line can be in operation for less number of hours than present and also in ingredients.

At present the company fills each jar of jam ½ gram over the standard weight to ensure a legal weight. With the new computerised system, they can bring the target weight closer to the standard weight.

That may not seem a great saving, but all those extra ½ grams of jam add up to tons!

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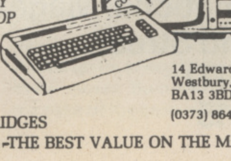

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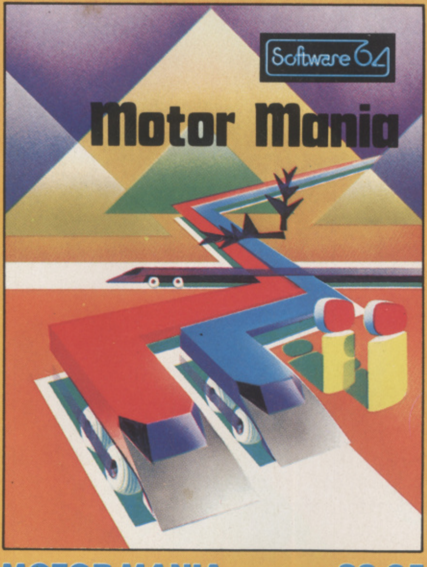

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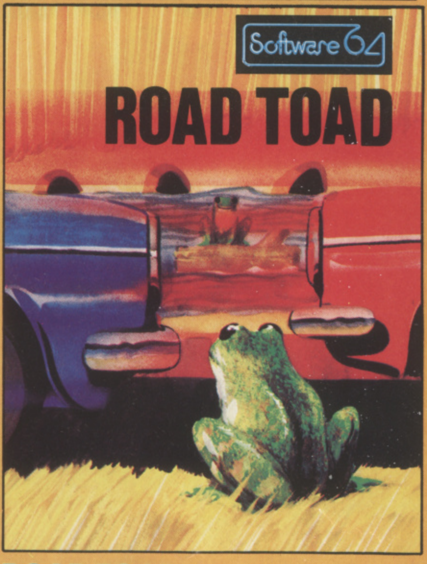

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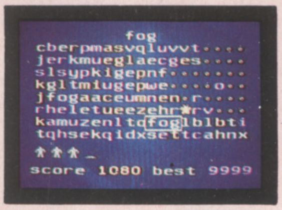

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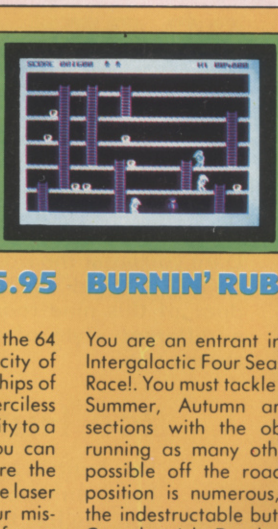

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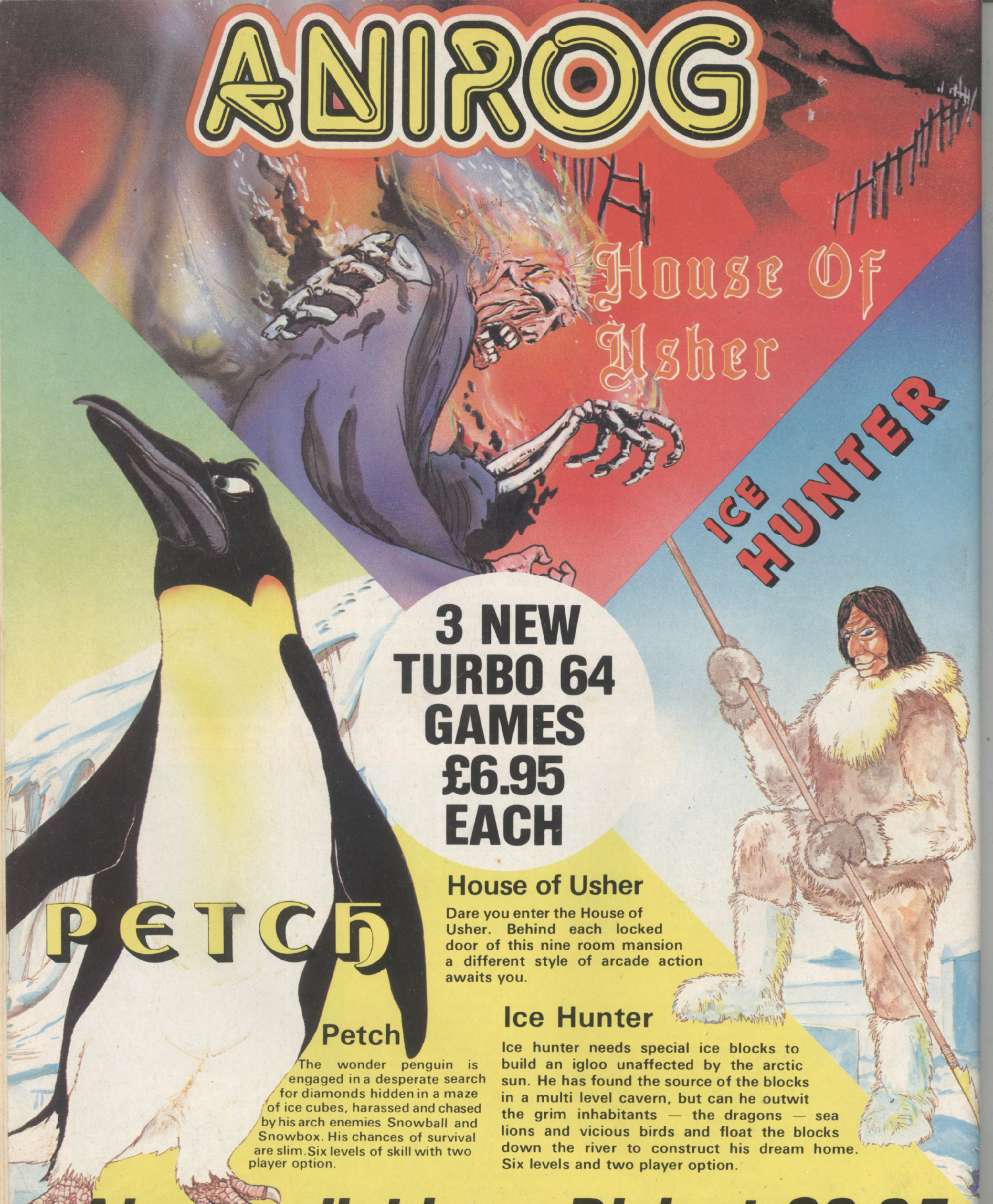

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